THE

LELAND STANFORD JUNIOR UNIVERSITY

REGISTER FOR 1892-93

PALO ALTO, CALIFORNIA
PUBLISHED BY THE UNIVERSITY
APRIL, 1893

THE

LELAND STANFORD JUNIOR

UNIVERSITY

SECOND ANNUAL REGISTER

1892-93

"The Beneficence of the Creator towards Man on Earth, and the possibilities of Humanity, are one and the same."—LELAND STANFORD.

PALO ALTO, CALIFORNIA
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UNIVERSITY CALENDAR.

1892.

Sept. 5	Monday.....	Entrance examinations begin.
Sept. 6-7	Tues.-Wed...	Registration of Matriculated Students.
Sept. 8	Thursday	Registration of New Students. Instruction begins.
Nov. 24 – Nov. 27	Thursday – Sunday	Thanksgiving Recess.
Dec. 22	Thursday	First Semester ends.

1893.

Jan. 9	Monday.....	Registration for Second Semester.
Jan. 10	Tuesday.....	Instruction begins.
Feb. 22	Wednesday...	Washington's Birthday.
Mar. 25 – Apr. 2	Saturday – Sunday	Easter Vacation.
May 14	Sunday	Memorial Day.
May 24	Wednesday ..	Instruction ends.
May 25 – May 27	Thursday – Saturday	Entrance Examinations at Palo Alto and other appointed places.
May 28	Sunday	Baccalaureate Sermon.
May 29	Monday.....	Class-Day.
May 30	Tuesday.....	Alumni Day.
May 31	Wednesday ..	Commencement.

Sept. 4	Monday.....	Entrance Examinations at Palo Alto begin.
Sept. 5 – Sept. 6	Tuesday – Wednesday	Registration of Matriculated Students.
Sept. 7	Thursday	Registration of New Students.
Sept. 8	Friday.....	Instruction begins.
Sept. 9	Saturday	Admission Day.
Nov. 30 – Dec. 3	Thursday – Sunday	Thanksgiving Recess.
Dec. 21	Thursday	First Semester ends.

1894.

Jan. 8	Monday.....	Registration for Second Semester.
May 30	Wednesday...	Commencement.

FOUNDERS.

LELAND STANFORD. JANE LATHROP STANFORD.

BOARD OF TRUSTEES.

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The Hon. Charles Goodall	San Francisco
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*The Hon. John Q. Brown	Sacramento
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Mr. Leon Sloss	San Francisco
Dr. Edward R. Taylor	San Francisco

Herbert C. Nash, Secretary.

Charles G. Lathrop, Attorney,
819 Market Street, San Francisco.

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* Deceased.

Faculty and Other Officers.

FACULTY.

[*Arranged in groups in the order of seniority of appointment.*]

DAVID STARR JORDAN, LL. D., President of the University.
Escondite Cottage.

M. S., Cornell University, 1872; M. D., Indiana Medical College, 1875; Ph. D., Butler University, 1878; LL. D., Cornell University, 1886. Instructor in Botany, Cornell University, 1871-72; Professor of Natural History, Lombard University, Illinois, 1872-73; Principal of the Appleton Collegiate Institute, Wisconsin, 1873-74; Student and afterward Lecturer in Marine Botany, Anderson School at Penikese, 1874; Teacher of Natural History, Indianapolis, Ind., High School, 1874-75; Lecturer on Zoology, Harvard Summer School, Cumberland Gap, 1875; Professor of Biology, Butler University, 1875-79; Naturalist of the Geological Surveys of Indiana and Ohio, 1877; Assistant to the U. S. Fish Commission, 1877-91; Student of Ichthyology, British Museum, Museum d'Histoire Naturelle, etc., 1879-81: Professor of Zoology, Indiana University, 1879-85; Special Agent of the U. S. Census Bureau, Investigating Marine Industries of Pacific Coast, 1880; Lecturer on Comparative Anatomy, Indiana Medical College, 1885; President of Indiana University, 1885-91.

*ANDREW DICKSON WHITE, LL. D., L. H. D., Non-Resident Professor of European History. *Ithaca, N. Y.*

A. B., Yale, 1853: A. M., 1856; Ph. D., University of Jena; LL. D., Michigan, Cornell, and Yale; L. H. D., Columbia College. Student at Berlin and Paris, 1853-56; Attaché of the American Legation at St. Petersburg, 1856; Professor of History and English Literature, University of Michigan, 1857 62; Member of the State Senate of New York, 1863-66; President of Cornell University and Professor of History, 1866-85; United States Commissioner to Santo Domingo, 1871; Chairman of the Jury of Public Instruction at the Centennial Exposition of 1876; Honorary Commissioner of the United States, and member of the Jury of Appeals, at the Paris Exposition of 1878; Envoy Extraordinary and Minister Plenipotentiary to the German Empire, 1879-81.

†BENJAMIN HARRISON, LL.D., Non-Resident Professor of Constitutional Law.

A. B. and LL.D., Miami University. Brevet Brigadier-General, U. S. A., 1865; U. S. Senator from Indiana, 1881-87; President of the United States, 1889–93.

GEORGE ELLIOTT HOWARD, A. M., Professor of History.
20 Alvarado Row.

A. B., University of Nebraska, 1876; A. M., 1879. Student in History and Jurisprudence, Universities of Munich and Paris, 1876-78; Professor of History, University of Nebraska, 1879-91; Secretary of the Nebraska State Historical Society, 1885-91.

* Absent as United States Minister to Russia.

† Beginning 1893–94.

JOHN CASPER BRANNER, Ph. D., Professor of Geology.
28 Alvarado Row.

B. S., Cornell University, 1882; Ph. D., Indiana University, 1885. Assistant Geologist to the Imperial Geological Survey of Brazil, 1875-78; Special Botanist for Thomas A. Edison in South America, 1880-81; Assistant on the Geological Survey of Pennsylvania, 1881; Special Agent of the U. S. Department of Argiculture for Investigating Cotton and the Insects affecting it in Brazil, 1882-83; Topographical Geologist of the Geological Survey of Pennsylvania, Anthracite District, 1883-85; Professor of Geology, University of Indiana. 1885-91; Director of the Scranton, Pa., Summer School of Geology, 1886; State Geologist of Arkansas, 1887-92.

OLIVER PEEBLES JENKINS, Ph. D., Professor of Physiology and Histology. *Cedro Cottage.*

A. B., Moore's Hill College, 1869; A. M., 1872; M. S., Indiana University, 1886; Ph. D., 1889. Graduate student in Northwestern University, Harvard, Johns Hopkins, and Indiana. Teacher in the public schools of Indiana, California, and Wisconsin, 1870-76; Professor of Natural Science, Moore's Hill College, 1876-82. Professor of Natural Science, Indiana State Normal School, 1883-86; Professor of Biology, De Pauw University, 1886-91; some time engaged in Zoological Explorations of the U. S. Fish Commission in Virginia, Tennessee, North Carolina, South Carolina, in the Gulf of California, and in the Sandwich Islands.

JOHN HENRY COMSTOCK, B. S., Professor of Entomology.
Mariposa Hall, January, February, and March.

B. S., Cornell University, 1874. Instructor in Entomology, Cornell University, 1873-77, Assistant Professor, 1877-82; Lecturer on Zoology, Vassar College, 1877; U. S. Entomologist, at Washington, 1879-81; Professor of Entomology and General Invertebrate Zoology, Cornell University, since 1882.

MELVILLE BEST ANDERSON, A. M., Professor of English Literature. *19 Salvatierra St.*

A. M., Butler University, 1877. Student at Cornell University, 1870-72, University of Göttingen, the Sorbonne, and the College de France, 1875-77; Professor of Modern Languages, Butler University, 1877-80; Professor of English Literature, Knox College, 1881-86; Professor of Literature and History, Purdue University, 1886-87; Professor of the English Language and Literature, University of Iowa, 1887-91.

JOHN MAXSON STILLMAN, Ph. D., Professor of Chemistry.
2 Alvarado Row.

Ph. B., University of California, 1874; Ph. D., 1885. Assistant in Chemistry, University of California, 1873-75; Student in Chemistry at Strassburg and Würzburg, 1875-76; Instructor in Organic and General Chemistry, University of California, 1876-82; Chemist of the Boston and American Sugar Refining Company, 1882-92.

FERNANDO SANFORD, M. S., Professor of Physics.
8 Alvarado Row.

B. S., Carthage College, 1879; M. S., 1882. Student, University of Berlin, 1886-88; Professor of Physical Science, Mt. Morris College, 1879-82; Superintendent of Schools, Ogle County, Ill., 1882-86; Instructor in Physics and Chemistry, Englewood High School, 1888-90; Professor of Physical Science, Lake Forest University, 1890-91.

HENRY ALFRED TODD, Ph. D., Professor of the Romance Languages. *2 Portolá St.*

A. B., Princeton College, 1876; Ph. D., Johns Hopkins University, 1885. Fellow and Tutor in Modern Languages, Princeton College, 1876-80; Student at the Universities of Berlin, Paris, Rome, and Madrid, 1880-83; Instructor and Associate in Romance Languages, Johns Hopkins University, 1883-91.

CHARLES DAVID MARX, C. E., Professor of Civil Engineering. *22 Alvarado Row.*

B. C. E., Cornell University, 1878; C. E. Karlsruhe Polytechnicum, 1881. Instructor in Civil Engineering, Karlsruhe Polytechnicum, 1880-81; U. S. Assistant Engineer, Missouri River Improvement, 1882-84; Assistant Professor of Civil Engineering, Cornell University, 1884-90; Engineer Inspector of Public Improvements, Rochester, N. Y., 1886; Professor of Civil Engineering, University of Wisconsin, 1890-91.

JOSEPH SWAIN, M. S., Professor of Mathematics. *10 Alvarado Row.*

B. L., Indiana University, 1883; M. S., 1885. Instructor in Mathematics and Zoology, Indiana University, 1883-1885; Assistant, U. S. Fish Commission, 1884; Professor of Mathematics, Indiana University, 1886-91; Student of Mathematics and Astronomy, University of Edinburgh, 1885-86.

ERNEST MONDELL PEASE, A. M., Professor of the Latin Language and Literature. *6 Alvarado Row.*

A. B., University of Colorado, 1882; A. M., 1885. Fellow in Johns Hopkins University, 1884-86; Instructor in Latin, Smith College, 1886; Professor of Latin, Bowdoin College, 1886-91.

CHARLES HENRY GILBERT, Ph. D., Professor of Zoology. *23 Salvatierra St.*

B. S., Butler University, 1879; M. S., Indiana University, 1882; Ph. D., 1883. Assistant in Natural Sciences and Modern Languages, Indiana University, 1880-84; Professor of Natural History, University of Cincinnati, 1884-88; Professor of Zoology, Indiana University, 1888-91; Assistant to the U. S. Fish Commission, 1880-91; Naturalist of U. S. Steamer Albatross, in exploration of the deep waters of the Pacific Coast, 1889-90.

DOUGLAS HOUGHTON CAMPBELL, Ph. D., Professor of Botany. *Lauro Hall.*

Ph. M., University of Michigan, 1882; Ph. D., 1886. Teacher of Biology, Detroit High School, 1882-86; Student at Bonn, Tübingen, and Berlin, 1886-88; Professor of Botany, Indiana University, 1888-91.

EARL BARNES, M. S., Professor of Education, and Secretary of the Faculty. *12 Alvarado Row.*

A. B., Indiana University, 1890; M. S., Cornell University, 1891. Graduate of Oswego, N. Y., Normal School, 1884; Teacher of English and History, Hoboken German Academy, 1884-86; Special Student in History and Psychology, Cornell University, 1886-87, '88-89; Student in Pedagogics, University of Zurich, 1887-88; Professor of History, Indiana University, 1889-91.

EDWIN HAMLIN WOODRUFF, LL. B., Librarian.
Lauro Hall.

LL. B., Cornell University, 1888. Assistant, Astor Library, 1883-84; Chief Cataloguer, Cornell University Library, 1884-88; Instructor in English, Cornell University, 1888-90; Librarian of the Fiske Library, Florence, Italy, 1890-91.

THOMAS DENISON WOOD, A. M., M. D., Professor of Physical Training and Hygiene. *10 Alvarado Row.*

A. B., Oberlin College, 1888; A. M., 1891; M. D., College of Physicians and Surgeons, New York City, 1891. Director Oberlin College Gymnasium, 1886-88; Student, Harvard University Summer School, 1886, 1889.

ALBERT WILLIAM SMITH, M. M. E., Professor of Mechanical Engineering. *22 Alvarado Row.*

B. M. E., Cornell University, 1878; M. M. E., 1886. Machinist and Contractor with Brown & Sharp Mfg. Co., Providence, R. I., 1879-80. Machinist and Shop Foreman, Straight Line Engine Works, Syracuse, N. Y., 1880-83; Superintendent, Kingsford Foundry and Machine Works, Oswego, N. Y., 1883-86; Fellow in Mechanical Engineering, Cornell University, 1886-87; Assistant Professor of Mechanical Engineering, Cornell University, 1887-91; Professor of Machine Design, University of Wisconsin, 1891-92.

EWALD FLÜGEL, Ph. D., Professor of English Philology.
Francisquito Cottage.

Ph. D., University of Leipzig, 1886. Student, Universities of Freiburg and Leipzig, 1882-92; Privat Docent, University of Leipzig, 1888-92.

CHARLES BENJAMIN WING, C. E., Professor of Structural Engineering. *College Terrace.*

C. E., Cornell University, 1886. Fellow in Civil Engineering, Cornell University, 1886-87; Engineer in Charge of Construction, Pompton Powder Co., Pompton, N. J., 1887; Instructor in Civil Engineering, Cornell University, 1887-90; Engineer, Phœnix Powder Co., Farmingdale, N. J., 1888; Assistant Engineer, Berlin Iron Bridge Co., East Berlin, Conn., 1889-90; Assistant Professor of Civil Engineering, Cornell University, 1890-91; Professor of Bridge and Hydraulic Engineering, University of Wisconsin, 1891-92.

FRANK ANGELL, Ph. D., Professor of Psychology.
76 E. Julian St., San Jose.

B. S., University of Vermont, 1878; Ph. D., University of Leipzig, 1891. Teacher in Washington (D. C.) High School, 1880-87; Student, University of Würzburg, 1885, University of Leipzig, 1889-91; Assistant Professor of Psychology, Cornell University, 1891-92.

LEANDER MILLER HOSKINS, C. E., Professor of Applied Mechanics. *College Terrace.*

B. C. E. and B. S., University of Wisconsin, 1883; M. S., 1885; C. E., 1887. Teacher in the Public Schools, Fountain City, Wis., 1883-84; Student in Mathematics, holding Morgan Fellowship, Harvard University, 1884-85; Instructor in Engineering, University of Wisconsin, 1885-89, Assistant Professor of Mechanics, 1889-91, Professor of Theoretical and Applied Mechanics, 1891-92; Assistant Field Topographer, U. S. Geological Survey, 1889-90.

JOSEPH SHILLINGTON OYSTER, U. S. A., Professor of Military Science and Tactics. *5 Lasuen St.*

Graduate United States Military Academy, West Point, 1874. Second Lieut., 1st Artillery, 1874, First Lieut., 1880.

ROBERT EDGAR ALLARDICE, A. M., Professor of Mathematics.
Lauro Hall.

A. M., University of Edinburgh, 1882. Baxter Scholar in Mathematics, University of Edinburgh, 1882-83. Drummond Scholar in Mathematics, 1883-84; Assistant Professor of Mathematics, University of Edinburgh, 1883-92.

AMOS GRISWOLD WARNER, Ph. D., Professor of Economics.

B. L., University of Nebraska, 1885; Ph. D., Johns Hopkins University, 1888. General Agent, Charity Organization Society, Baltimore, 1887-89; Professor of Political Economy, University of Nebraska, 1889-91; Superintendent of Charities, Washington, D. C., 1891-93.

WILLIAM RUSSELL DUDLEY, M. S., Professor of Botany.
16 Alvarado Row.

B. S., Cornell University, 1874; M. S., 1876. Instructor in Botany, Cornell University, 1872-76. Assistant Professor, 1876-92; Teacher of Botany in the Martha's Vineyard Summer Institute, 1878-79; Acting Professor of Biology, Indiana University, 1880.

AUGUSTUS TABER MURRAY, Ph. D., Professor of Greek.
College Park.

A. B., Haverford College, 1885; Ph. D., Johns Hopkins University, 1890; Fellow in Johns Hopkins University, 1887-88; Professor of Greek, Earlham College, 1888-90; Student, Universities of Leipsic and Berlin, 1890-91; Professor of Greek, Colorado College, 1891-92.

ALBERT PRUDEN CARMAN, D. Sc., Professor of Electricity.
Lauro Hall.

A. B., College of New Jersey, Princeton, 1883; A. M., 1886; D. Sc., 1886. Fellow in Experimental Science, Princeton, 1883-84, Acting Instructor in Physics, 1884-85, Tutor in Mathematics, 1885-87; Student, University of Berlin, 1887-89; Professor of Physics and Applied Electricity, Purdue University, 1889-92.

JULIUS GOEBEL, Ph. D., Professor of Germanic Literature and Philology.
Menlo Park.

Ph. D., University of Tübingen, 1882. Student, University of Leipzig, 1879-81; Instructor in German, Johns Hopkins University, 1885-88; Editor *Belletristisches Journal*, 1888-92.

*EDWARD ALSWORTH ROSS, Ph. D., Professor of Finance and Administration.

A. B., Coe College, 1886; Ph. D., Johns Hopkins University, 1891. Professor of Economics and Social Science, Indiana University, 1891-92; Associate Professor of Political Economy and Finance, Cornell University, 1892-93.

*NATHAN ABBOTT, A. B., LL.B., Professor of Law.

A. B., Yale University, 1876; LL.B., Boston University, 1880. Professor of Law, University of Michigan, 1891-92; Professor of Law, Northwestern University, 1892-93.

*Beginning September, 1893.

GEORGE MANN RICHARDSON, Ph. D., Associate Professor of Organic Chemistry. *18 Alvarado Row.*

A. C., Lehigh University, 1886; Ph. D., Johns Hopkins University, 1890. Student in Chemistry, Johns Hopkins University, 1886 88; Instructor in Quantitative Chemical Analysis, Lehigh University, 1888-89; Fellow in Chemistry, Johns Hopkins University, 1889-90; Instructor in Organic Chemistry, Lehigh University, 1890-91.

JAMES OWEN GRIFFIN, Associate Professor of German. *32 Alvarado Row.*

Graduate of the Pennsylvania State Normal School, 1873; Teacher in Pennsylvania State Normal School, 1873-74; Principal Unadilla (N. Y.) Academy, 1874 79; Student, University of Göttingen, 1879 80; Principal of Delaware Academy, (Delhi, N. Y.,) 1880-85; Instructor in German, Cornell University, 1885-91; Registrar, Cornell University, 1890-91.

†EDWARD HOWARD GRIGGS, A. M., Associate Professor of Ethics.

A. B., University of Indiana, 1889; A. M., 1890; Instructor in English Literature, University of Indiana, 1889-91; Lecturer in English Literature in the Glenmore School of the Culture Sciences (N. Y.), 1891.

WALTER MILLER, A. M., Associate Professor of Latin and Archæology. *College Terrace.*

A. M., University of Michigan, 1884. Student, University of Leipzig, 1884-85 and 1889-91; Member of the American School of Classical Studies at Athens, 1885-86; Instructor in Greek, University of Michigan, 1886-87, Instructor in Latin and Sanskrit, 1887 88, Acting Assistant Professor, 1888-89; Senior, Royal Archæological Seminary, University of Leipzig, 1890-91; Associate Professor of Greek, University of Missouri, 1891-92.

ARLEY BARTHLOW SHOW, A. M., Associate Professor of European History. *Mayfield.*

A. B., Doane College, 1882; B. D., Andover Theological Seminary, 1885; A. M., Doane College, 1892. Pastor Congregational Church, Waco, Neb., 1885-87; Professor of History and English Literature, Doane College, 1887-92.

WILLIAM HENRY HUDSON, Associate Professor of English. *Lauro Hall.*

Assistant, Library of Sion College, London, 1885-86; Librarian, City Liberal Club, London, 1889-90; Cataloguer, President White Library, Cornell University, 1890-91; Assistant Librarian, Cornell University, 1891-92.

* RUFUS LOT GREEN, A. M., Associate Professor of Mathematics.

B. S., Indiana University, 1885; A. M., 1890. Instructor in Mathematics, Indiana University, 1885 86; Graduate Student, Johns Hopkins University, 1886-87; Professor of Pure Mathematics, Indiana University, 1887-93.

ORRIN LESLIE ELLIOTT, Ph. D., Secretary and Registrar. *24 Alvarado Row.*

Ph. B., Cornell University, 1885; Ph. D., 1890. Fellow in History and Political Science, Cornell University, 1885-86; Instructor in English, Cornell University, 1886-91, and Assistant Registrar and President's Secretary, 1890-91.

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* Beginning September, 1893.
† Absent during 1892-93.

GEORGE HOLMES BRYANT, B. S., Assistant Professor of Steam Engineering. *16 Alvarado Row.*

B. S., Massachusetts Institute of Technology, 1883. Director of Department of Mechanic Arts, Alabama Polytechnic Institute, 1885–91.

MARTIN WRIGHT SAMPSON, A. M., Assistant Professor of English. *3 Salvatierra St.*

A. B., University of Cincinnati, 1888; A. M., 1890. Student, University of Munich, 1887–88; Instructor in English, University of Iowa, 1889–91; Assistant Professor of English Literature, University of Iowa, 1891.

MARY SHELDON BARNES, A. B., Assistant Professor of History. *12 Alvarado Row.*

A. B., University of Michigan, 1874. Teacher of Greek, Latin, and History, Oswego (N. Y.) Normal School, 1875–76; Professor of History, Wellesley College, 1877–79; Student in Modern History, Cambridge, Eng., 1880–81; Student at Zürich and British Museum, 1887–88.

EMORY EVANS SMITH, Assistant Professor of Horticulture. *Lauro Hall.*

Editor California *Florist and Gardener*, 1888–89; Associate Editor *Pacific Rural Press*, 1889; Editor California *Fruit Grower*, 1890–92; Secretary California State Floral Society, 1888–93; President Florists' Club of California, since 1891; Non-Resident Lecturer on Horticulture, Leland Stanford Junior University, 1891–92.

WILLIAM JOSEPH HUSSEY, B. S., Assistant Professor of Astronomy, and Instructor in Mathematics. *20 Alvarado Row.*

B. S., University of Michigan, 1889. Assistant in the Nautical Almanac Office, Washington, D. C. 1889; Instructor in Mathematics, University of Michigan, 1889–91, Instructor in Astronomy and Acting Director of the Observatory, 1891–92.

BOLTON COIT BROWN, M. P., Assistant Professor of Drawing and Painting. *24 Alvarado Row.*

B. P., Syracuse University, 1885; M. P., 1889. Instructor in Freehand Drawing, Cornell University, 1885–88; Principal, Fine Art Department, Government Art School, and Parkdale Art School, Toronto, 1889–90; Instructor in Art, Buchtel College, 1890–91.

SAMUEL JACQUES BRUN, B. S., Assistant Professor of French. *Mayfield.*

B.-ès-S., Montpelier, France, 1876. French Master, Ackworth School, England, 1879–80; Instructor in French, Haverford College, 1881–82; Instructor in French, Cornell University, 1882–86.

ALPHONSO GERALD NEWCOMER, A. M., Assistant Professor of English. *Menlo Park.*

A. B., University of Michigan, 1887; A. M., Cornell University, 1888. Instructor in Latin and French, Knox College, 1889–91.

HENRY BURROWES LATHROP, A. B., Assistant Professor of English. *1414 Guerrero St., San Francisco.*

A. B., Harvard University, 1889. Assistant Professor of English, Hobart College, 1889–90; Instructor in English, Harvard University, 1890–92.

JAMES PERRIN SMITH, Ph. D., Assistant Professor of Mineralogy and Paleontology. *5 Salvatierra St.*

A. M., Vanderbilt University, 1886; Ph. D., University of Göttingen, 1892. Assistant Geologist and Chemist, Arkansas Geological Survey, 1887–90.

FREDERICK CONVERSE CLARK, Ph. D., Assistant Professor of Economics. *Palo Alto Park.*

A. B., University of Michigan, 1887; A. M., 1888; Ph. D., 1891. Teacher of History and Economics, Ann Arbor High School, 1888–92.

LIONEL REMOND LENOX, Ph. B., Assistant Professor of Chemistry. *College Terrace.*

Ph. B., Columbia College, 1888. Assistant Chemist, Bethlehem Iron Co., 1887; Instructor in Chemistry, Lehigh University, 1888–91; Chemist, Ordnance Department, U. S. N., Washington, D. C., 1891–92.

* VERNON LYMAN KELLOGG, M. S., Assistant Professor of Entomology.

B. S., University of Kansas, 1889; M. S., 1892. Instructor in Botany and Zoology, University of Kansas, 1888–89; Assistant Professor of Entomology, 1890–93; Student in Entomology, Cornell University, 1891.

†WILLIAM HOWARD MILLER, A. B., Instructor in Mathematics. *14 Alvarado Row.*

A. B., Johns Hopkins University, 1888. Graduate Scholar, Johns Hopkins University, 1888–89; Instructor in Preparatory School, Centreville, Md., 1889–91.

JOHN ANTHONY MILLER, A. B., Instructor in Mathematics. *14 Alvarado Row.*

A. B., Indiana University, 1890. Superintendent of Schools, Rockville, Ind., 1890–91.

ELLEN LOUISE LOWELL, Instructor in Physical Training, *1 Lasuen St.*

Graduate of Sargent's Normal School of Physical Culture, Harvard University.

MERRITT EUGENE TAYLOR, M. S., Instructor in Physics. *8 Alvarado Row.*

B. S., Northwestern University, 1883; M. S., 1884. Assistant in Chemistry, Northwestern University, 1883–84, Instructor in Mathematics, 1884–86; Student at Universities of Berlin, Zürich, and Johns Hopkins, 1886–89; Electrician, Incandescent Lamp Co., Chicago, 1889–92.

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*Beginning September, 1893.

†Died March 2, 1893.

ELSA LOVINA AMES, Instructor in Drawing.
1 Lasuen St.

Student, College of Fine Arts, Syracuse University, 1888-91.

LUDWIG HEINRICH GRAU, Ph. D., Instructor in German.
San Francisco.

Ph. D., University of Munich, 1879. Student, Universities of Marburg and Halle, 1874-78; Instructor in Modern Languages, Royal College of Rothenburg, 1879-80; Professor of Modern Languages and Literature, Royal College of Memmingen, 1880-83; Teacher of Modern Languages, San Francisco and Oakland, 1885-92

ARTHUR BRIDGMAN CLARK, M. Ar., Instructor in Drawing and Architectural Draughting. *College Terrace.*

B. Ar., Syracuse University, 1888; M. Ar., 1891. Director of Trades Schools and Instructor in Drawing, New York State Reformatory, Elmira, N. Y., 1888-89; Instructor in Architecture, Syracuse University, 1889-92.

CHARLES ELLWOOD COX, A. B., Instructor in Mathematics.
College Park.

A. B., Haverford College, 1880. Principal of Friends Academy, Le Grand, Iowa, 1880-85; Professor of Mathematics, University of the Pacific, 1886-91.

WALTER ORLANDO BLACK, M. S., Instructor in Physical Training. *9 Salvatierra St.*

B. S., Knox College, 1889; M. S., 1892. Student, Springfield (Mass.) School of Physical Training, 1890-92; Physical Director, Central Branch Y. M. C. A., Springfield, Mass., 1891-92.

FRANK MACE McFARLAND, Ph. B., Instructor in Histology.
Palo Alto Park.

Ph. B., De Pauw University, 1889. Assistant in Biology, DePauw University, 1888-89; Professor of Biology, Olivet College, 1889-92.

HERMAN DE CLERCQ STEARNS, A. B., Instructor in Physics.
11 Salvatierra St.

A. B., Leland Stanford Junior University, 1892.

GEORGE CLINTON PRICE, B. S., Instructor in Zoology.
Mayfield.

B. S., DePauw University, 1890. Student in Biology, Johns Hopkins University, 1890-92.

DANIEL WILLIAM MURPHY, A. B., Instructor in Physics.
Encina Hall.

A. B., Leland Stanford Junior University, 1892.

CHARLES WILSON GREENE, A. B., Instructor in Physiology.
Cedro Cottage.

A. B., Leland Stanford Junior University, 1892.

* WILBUR WILSON THOBURN, Ph. D., Instructor in Zoology, and Acting Curator of the Zoological Museum.

A. B., Allegheny College, 1881; A. M., 1884; Ph. D., 1888. Teacher of Natural Science, Pennsylvania State Normal School, 1881-84; Professor of Geology and Botany, Illinois Wesleyan University, 1884-1888; Professor of Geology and Biology, University of the Pacific, 1888-91.

ASSISTANTS.

LOUIS ALEXANDER BUCHANAN, Foreman of the Wood-working Shop. *3 Salvatierra St.*

Pattern-maker and Model-maker, 1877-82; Student in Mechanical Engineering, Washington University, 1882-86; Instructor in Mechanical Drawing and Mathematics, Polytechnic Evening School, St. Louis, 1882-88; Practical Woodworker and Machine Designer, 1886-87; Draughtsman for the St. Louis Water Works Construction, 1887-89; Foreman of Construction, N. O. Nelson Manufacturing Co., 1890-91.

EDWARD THOMAS ADAMS, Assistant in Mechanical Draughting. *Mayfield.*

Practical Mechanic and Pattern-maker. Teacher of Drawing, Stockton Public Schools, 1890-91.

WILLIS GRANT JOHNSON, A. B., Assistant in Entomology. *11 Salvatierra St.*

A. B., Leland Stanford Junior University, 1892.

GEORGE ARCHIBALD CLARK, B. L., Assistant in Stenography, and President's Stenographer. *Mayfield.*

B. L., University of Minnesota, 1891. Student in Latin, Leland Stanford Junior University, 1891-93.

CARL LANE CLEMANS, Ph. B., Assistant in Physics. *Mariposa Hall.*

Ph. B., Cornell College, 1891.

MARY LILY MEYRICK, Assistant in Education, in charge of the Kindergarten. *Roble Hall.*

LUIS DUQUE, Assistant in Spanish. *San Francisco.*

WALTER ROBERT SHAW, A. B., Assistant in Botany. *Palo Alto Park.*

A. B., Leland Stanford Junior University, 1892.

* Beginning September, 1893.

NELS JENSEN HERBY, Foreman of the Forge.
Mayfield.

ALBERT JAMES BROWN, A. B., Registrar's Assistant.
Encina Hall.

A. B., Leland Stanford Junior University, 1892.

JOHN KINLAY WIGHT, Library Assistant.
Mayfield.

EDWIN CHAPIN EWELL, Library Assistant.
Mayfield.

LECTURERS.

RICHARD ALEXANDER FULLERTON PENROSE, JR., Ph. D., Lecturer on Economic Geology.

A. B., Harvard University, 1881; A. M. and Ph. D., 1886. Assistant, United States Geological Survey, 1881-86; Superintendent of Mines at Buckingham and Perth, Canada, 1886-88; Assistant Geologist, Geological Survey of Texas, 1888-89; Assistant Geologist, Geological Survey of Arkansas, 1889-92; Associate Professor of Economic Geology, University of Chicago, since 1892.

OTHER OFFICERS.

WILL S. MONROE, Master of Encina Hall. *42 Encina Hall.*

ELLEN FRANCES THOMPSON, Mistress of Roble Hall.
1 Roble Hall.

CHARLES EDWARD HODGES, Resident Architect.
1 Lasuen Street.

HENRY B. SHACKLEFORD, Superintendent of Grounds.
San Jose.

HERBERT G. SNYDER, Business Agent. *Mayfield.*

ROBERT HENRY MOORE, Chief Engineer. *Palo Alto.*

GEORGE ADDERSON, Chief Steward. *202 Encina Hall.*

STANDING COMMITTEES OF THE FACULTY.

Students' Affairs:—Professors MARX, GRIFFIN, and SWAIN.

Admission of Students:—Professors STILLMAN, A. W. SMITH, MURRAY, and the REGISTRAR.

Doubtful Cases:—Professors MARX, RICHARDSON, and W. MILLER.

Entrance Requirements:—Professors PEASE, ANDERSON, SWAIN, JENKINS, and E. BARNES.

Petitions:—Professors WING, FLÜGEL, and PEASE.

Intercollegiate Affairs:—Professors BRANNER, STILLMAN, and ANGELL.

Chapel Exercises:—Professors GRIFFIN, MURRAY, and WOOD.

Receptions:—Professors WOODRUFF, OYSTER, GOEBEL, CAMPBELL, and ALLARDICE.

Publications:—Professors HOWARD, TODD, WOODRUFF, GILBERT, FLÜGEL, and the REGISTRAR.

Graduation:—Professors SANFORD, TODD, and HOWARD.

University Extension and Summer School:—Professors E. BARNES, SANFORD, and MURRAY.

Public Exercises:—Professors ANDERSON, CAMPBELL, and WING.

Resolutions:—Professors OYSTER, ALLARDICE, and HOSKINS.

Athletics:—Professors WOOD, RICHARDSON, and SWAIN.

World's Fair:—Professors A. W. SMITH, CARMAN, BRANNER, E. BARNES, and E. E. SMITH.

Hopkins Laboratory:—Professors GILBERT, JENKINS, CAMPBELL, and DUDLEY.

Buildings:—Professors HOSKINS, GOEBEL, and CARMAN.

Organization and Administration.

FOUNDATION OF THE UNIVERSITY.

The founding at Palo Alto of "a university for both sexes, with the colleges, schools, seminaries of learning, mechanical institutes, museums, galleries of art, and all other things necessary and appropriate to a university of high degree," was determined upon by the Hon. Leland Stanford and Jane Lathrop Stanford, in 1884. In March of the year following the Legislature of California passed an Act providing for the administration of trust funds in connection with institutions of learning. November 14, 1885, the Grant of Endowment was publicly made, in accordance with this Act, and on the same day the Board of Trustees held its first meeting in San Francisco. The work of construction was at once begun, and the corner-stone laid May 14, 1887, the nineteenth anniversary of the birth of Leland Stanford, Jr. The University was formally opened to students October 1, 1891.

NAME AND PURPOSE OF THE INSTITUTION.

The idea of the University, in the words of its founders, "came directly and largely from our son and only child Leland; and in the belief that had he been spared to advise as to the disposition of our estate, he would have desired the devotion of a large portion thereof to this purpose, we will that for all time to come the institution hereby founded shall bear his name, and shall be known as The Leland Stanford Junior University."

The object of the University, as stated in its Charter, is "to qualify students for personal success and direct usefulness in life;" and its purposes, "to promote the public welfare by exercising an influence in behalf of humanity and civilization, teaching the blessings of liberty regulated by law, and inculcating love and reverence for the great principles of government as derived from the inalienable rights of man to life, liberty, and the pursuit of happiness."

LOCATION.

The University is located on the Palo Alto estate in the Santa Clara Valley, thirty-three miles southeast of San Francisco, on the Coast Division of the Southern Pacific Railway. The estate consists of eight thousand four hundred acres, partly lowland and partly rising into the foothills of the Sierra Morena. On the grounds are the residence of the founders and an extensive arboretum containing a very great variety of shrubs and trees. The Bay of San Francisco lies about three miles east of the University buildings, and across the bay the Monte Diablo Range rises to the height of over four thousand feet. The Lick Observatory, crowning Mt. Hamilton, the highest of the range, is plainly visible. To the southwest, between the valley and the ocean, is the heavily wooded Santa Cruz Range, two thousand to four thousand feet in height.

The Santa Clara Valley is one of the most attractive portions of the State in climate, in natural beauty, and in the fertility and adaptiveness of its soil to all the varied fruits of California. The characteristics of the climate are its evenness of temperature, its pure and bracing air, and its freedom alike from the fogs and harsh winds of the coast and from the oppressive summer heat of the interior valleys. In winter the mercury rarely falls

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DIRECTORY.

[The rooms in the Quadrangle are numbered consecutively beginning at the left of the main entrance, ten numbers being allotted to each building.]

The office of the *President* is room 112.

The office of the *Registrar* is room 110.

The *Library* is room 2.

below 30°, and the average midday temperature is about 60°; in summer the average midday temperature is between 75° and 80°, while the nights are always cool. The rainfall of about twenty inches is chiefly confined to the months from December to April inclusive.

ENDOWMENT.

The property conveyed to the University, in addition to the Palo Alto estate, consists of the Vina estate, in Tehama County, of fifty-nine thousand acres, of which about four thousand acres are planted in vines, and the Gridley estate, in Butte County, of twenty-two thousand acres, devoted mainly to the raising of wheat.

BUILDINGS.

In arranging the buildings and grounds the plan has been to conform them to the peculiar climatic conditions of California, and to provide for indefinite expansion without crowding or distortion. A series of quadrangles to be erected as the needs of the University demand, will furnish facilities for all general University work. Surrounding these will be various detached buildings for miscellaneous purposes, and the University town, with carefully laid out streets and grounds.

The central group of buildings will constitute two quadrangles, one entirely surrounding the other. Of these the inner quadrangle, with the exception of the chapel, is now completed. Its twelve one-story buildings are connected by a continuous open arcade, facing a paved court five hundred and eighty-six feet long by two hundred and forty-six feet wide, or three and a quarter acres. The buildings are of a buff sandstone, somewhat varied in color. The stonework is of broken

ashlar with rough rock face, and the roofs are covered with red tile. The architectural *motif* is to be found in the old Spanish Missions of California.

The grounds to the east and west of the central quadrangles have been reserved for six other quadrangles, three on either side. Behind the central quadrangles will be the workshops of the mechanical engineering department, the boiler and power houses, and the mechanical laboratories—of which the shops, foundry, and boiler house are now completed.

The dormitories are east and west of the quadrangle. *Encina Hall*, for young men, is at the east, and occupies a ground area of 312 x 150 feet. It is provided with electric lights, hot and cold water, steam heat, suitable furniture, bath rooms on each floor, and has accommodations for 315 students. Four stories high, built of the same material as the quadrangle, and decorated with end arcades, a central arched porch, and mosaic work, it forms the terminus of what will be the grand façade of the University, two-thirds of a mile long. *Roble Hall*, for young women, is at the west. It is of concrete, is about a third the size of Encina Hall, and will accommodate 100 students.

The Leland Stanford Junior Museum, a concrete building, 386 x 156 feet, including wings, is situated a quarter of a mile from the quadrangle, and on the west side of the Palo Alto avenue. At the main entrance, four large columns form the principal feature of the façade. The vestibule is 45 x 56 feet, and 70 feet high, and is faced with marble. The building is surmounted by statues of Plato, Herodotus, Aristotle, and Plutarch. The archæological and art collections of the University will be placed in the Museum at an early day; and it is temporarily used for the class-room work of the Department of Drawing and Painting.

Encina and Roble Gymnasiums are substantial frame buildings, equipped with the necessary apparatus and appliances for physical training.

LIBRARY.

One building of the quadrangle is at present devoted exclusively to the library. It has a shelving capacity of twenty-three thousand volumes, and the reading room will accommodate one hundred and twenty-five students.

The library now numbers fifteen thousand volumes and four thousand pamphlets. Although there have as yet been no large purchases of private collections, the library growth will conform to the demands of professors and students as the needs arise. The most notable gift to the library has been the valuable collection of railway books presented by Mr. Timothy Hopkins, of San Francisco. This special collection is unusually rich in materials for the study of the early history of railways in Europe and America, and the donor has made generous provision for the maintenance and increase of the collection until it shall be practically complete.

In addition to the University library, various large collections in San Francisco can be made available to a greater or less extent. The Mechanics' Institute and Mercantile are subscription libraries, and the Public, a circulating library to residents of the city, can be used for reference. The Sutro Library, founded by Mr. Adolph Sutro, and containing about two hundred and fifty thousand volumes, chosen with particular reference to the needs of investigators, is accessible to graduate students and students engaged in special lines of investigation. It is especially rich in mediæval publications and in books and pamphlets illustrative of the history of Europe.

THE HOPKINS LABORATORY OF NATURAL HISTORY.

A seaside laboratory of natural history has been founded as a branch of the University by the liberality of Mr. Timothy Hopkins, of San Francisco. The laboratory is located on Point Aloha, a headland near the town of Pacific Grove, on the Bay of Monterey. It is provided with aquaria and with all apparatus necessary for carrying on studies in the structure, development, and life history of marine animals and plants, and is open during the summer vacation of each year to naturalists wishing to carry on original investigations, and to students and teachers who desire to make themselves familiar with methods of study in marine zoology and botany. The work of the laboratory is under the general direction of Professors Gilbert and Jenkins, the committee of the University Faculty in charge. The general purpose of the laboratory is similar to that of the Marine Zoological Laboratory at Woods Holl, Mass., and to that of the seaside and marine laboratories established by Johns Hopkins University at different places along the Atlantic Coast.

SCIENTIFIC COLLECTIONS.

It is intended to bring together in the museums of the University a full representation of the natural history and mineral products of California, collections of all books, pamphlets, photographs, and maps bearing upon the early history of the West, and full collections of Indian antiquities and illustrations of aboriginal life. It is desired to receive donations from all persons who are interested in the work and who have material of value to the museums. All collections sent in this way will be carefully labelled and preserved, and the name of the donor will be kept on record. Messrs. Wells, Fargo &

Co. generously offer to transport such gifts to the University free of charge, and have instructed their officials "to receive and promptly forward such offerings as may be tendered from time to time."

TRUSTEES.

The general management and control of the institution is vested in a board of twenty-four trustees, chosen for life, of whom fifteen constitute a quorum. The charter provides that the Founders, during their lives, shall "perform all the duties and exercise all the powers and privileges enjoined upon and vested in the trustees."

FACULTY AND COUNCIL.

The Faculty consists of the President, professors, associate professors, assistant professors, and instructors, aided by non-resident lecturers, assistants, and other officers. Its routine work is divided among the following committees: on Students' Affairs; on Publications; on Petitions; on Chapel Exercises; on Athletics; on Entrance Requirements; on Admission of Students; on Graduation; on Receptions; on Music; on "Doubtful Cases"; on University Extension and Summer School; on Buildings; on Public Exercises; on Intercollegiate Affairs; on Resolutions; on World's Fair; on the Hopkins Laboratory.

The University Council consists of the President, professors, including the librarian, and associate professors. To the Council are entrusted the determination of requirements for admission, and for the various degrees; the recommendation of candidates for graduation; and the selection of Fellows. It also acts as an advisory body on any questions of general policy that may be submitted to it by the President or Trustees.

GOVERNMENT OF THE STUDENTS.

In the government of the University the largest liberty consistent with good work and good order will be given to the students. The University is not a reform school; its bounty is intended for the earnest and industrious student, and the indolent or unworthy will not be retained in the institution.

RELIGIOUS SERVICES.

Religious instruction is given in accordance with the provision of the Charter which prohibits sectarian instruction, but requires the teaching of "the immortality of the soul, the existence of an all-wise and benevolent Creator, and that obedience to His laws is the highest duty of man." Voluntary chapel exercises are held daily, and a sermon or address on some religious or ethical subject is given every Sunday morning by some clergyman or layman invited from abroad, or by some member of the Faculty.

A Students' Christian Association, a Young Men's Christian Association, and a Young Women's Christian Association have been organized. Regular meetings are held, and systematic courses of Bible Study carried on. The Christian Associations have compiled a *Hand-Book* containing special information relating to the details of university life at Palo Alto, including library regulations, registration rules, boarding places, etc. This handbook will be mailed to prospective students on application to the Registrar.

GENERAL STUDENT ORGANIZATIONS.

In addition to the Christian Associations noted above, the following general student organizations have been formed for mutual assistance and improvement in various lines: Associated Students; Co-operative

Association; Athletic Association; Encinal Glee Club; Students' Congress; Society of Art; Biological Society; Engineers' Society; Physical and Chemical Society; Philological Club; Alpha Literary Society; Euphronia Literary Society; Boat Club.

DEPARTMENTS.

The following Departments have been established: Greek; Latin; Germanic Languages; Romance Languages; English Language and Literature; Psychology; Ethics; Education; History; Economics and Social Science; Law; Mathematics; Physics; Chemistry; Botany; Entomology; Horticulture; Physiology; Physical Training; Zoology; Geology; Drawing and Painting; Mining Engineering; Civil Engineering; Mechanical Engineering; Electrical Engineering; Military Science and Tactics.

Admission and Graduation.

Candidates for admission must be at least sixteen years of age. They must present certificates of good moral character, and if from other colleges or universities, must bring letters of honorable dismissal.

ENTRANCE EXAMINATIONS.

Examinations in all entrance subjects are held at the beginning and at the end of the school year. In May these examinations will be held at Palo Alto and simultaneously at other appointed places; in September, at Palo Alto only. (See pp. 5 and 33.) No entrance examinations will be held at any other time. Specimen examination papers may be obtained on application to the Registrar.

ADMISSION ON EXAMINATION.

All candidates for admission, except those provided with certificates, as specified on page 34, must present themselves for examination in *ten* of the following subjects, including 1 (English):

1. English.
2–3. Elementary Algebra.
4. Plane Geometry.
5. Solid Geometry and Trigonometry.
6. Advanced Algebra.
7. Physics.
8. Chemistry.
9. Physiology.
10. Botany.
11. Zoology.
12. Freehand Drawing.
13. American History.
14. English History.
15. Grecian and Roman History.
16. English Literature.
17. Spanish.
18–19. French.
20–21. German.
22–23. Latin.
24. Latin.
25–26. Greek.

Solid Geometry and Trigonometry together count as one subject; Elementary Algebra, French, German, and Greek count as two subjects each; Latin as three: but Latin may be divided, candidates offering 22–23 without 24.

The following will indicate the amount of preparation necessary in the various subjects. Full equivalents of the specific work outlined will be accepted in all subjects.

1. English.—a. *Poetry and the Drama:* Shakspere's Merchant of Venice and Julius Cæsar; Scott's Lady of the Lake; Whittier's Snow-Bound; Longfellow's Evangeline. *Prose*: Irving's Sketch-Book; Thackeray's Newcomes; the Sir Roger de Coverley Papers from the Spectator; Scott's Quentin Durward; Macaulay's Essay on Addison; Macaulay's Life of Johnson.

[Substantial equivalents, such as the books prescribed by the University of California or by Harvard University, will be accepted in 1893, instead of any or all of the books in this list.]

b. Every applicant will also be required to undergo a test of his ability to write exercises correct in spelling, punctuation, sentence-structure, and paragraphing. He may be called upon, for instance, to write a business letter upon some assigned subject, to put into his own language an essay, the material of which is provided him, or to write from dictation; or his examination papers in other subjects may be submitted to the examiner in English; in short, he may be subjected to any fair test of his mastery of the English language for the practical purposes of life. (The equivalent of two years in the High School.)

[Students who are conditioned in English 1 *b* will be given an opportunity to make up their deficiency in voluntary classes under private instructors approved by the University. These instructors will charge a fee not exceeding ten dollars a semester.]

2–3. Elementary Algebra.—Fundamental operations, factoring, highest common factors, lowest common multiples, fractions, equations of first degree, fractional and negative exponents, involution, evolution, surds, quadratic equations, simultaneous equations of second degree, equations solved like quadratic equations, ratio and proportion. All of McLellan's Algebra; or the portion indicated in Charles Smith's Elementary Algebra, or an equivalent. (The equivalent of one and a half years in the High School.)

4. Plane Geometry.—As much as is contained in Byerly's Edition of Chauvenet's Geometry, or an equivalent, including a large selection of original exercises. (The equivalent of one year in the High School.)

5. a. Solid Geometry.—As much as is contained in Byerly's Edition of Chauvenet's Solid Geometry, with additional exercises. (The equivalent of one half year in the High School.) **b. Trigonometry.**—As much as is contained in Lock's Plane Trigonometry, including a thorough knowledge of the use of trignometric tables. (The equivalent of one half year in the High School.)

6. Advanced Algebra.—Chapters I—XVI, XIX—XXIV, XXXI—XXXII, in Charles Smith's Treatise on Algebra, or an equivalent. (The equivalent of one year in the High School, in addition to the elementary course in Algebra.)

7. Physics.—The equivalent of a year's work in experimental Physics. This should cover the amount of laboratory practice outlined in such a manual as Allen's Laboratory Physics, Hall and Bergen's Physics, Shaw's Physics by Experiment, Gage's Laboratory Manual, or Chute's Physics. It is preferred that the study begin by the experimental method, and that recitations from a text should follow, rather than precede the working out of the experiments by the pupils. Candidates for entrance credit in this subject should present their laboratory note books with their application.

8. Chemistry.—Besides the usual text-book and recitation work, each student should have a course in the laboratory, where he performs the experiments for himself. The amount of laboratory work desired cannot be obtained with less than four hours' per week for one school year spent in actual laboratory work. It is preferred that the laboratory work be entirely upon *general*, rather than partly upon *analytical* chemistry. The course required is comprised in Remsen's Introduction to the Study of Chemistry. The Inorganic portion of Roscoe's Elementary Chemistry, or of Eliot and Storer's Elementary Chemistry, with a proper course of laboratory experiments such as is given in Williams' Manual, or in Smith and Keller's Laboratory Manual, are also recommended as covering the course required.

9. Physiology.—The elements of human physiology and hygiene, the equivalent of Martin's Human Body (not the "Briefer Course"). The text-book work should be accompanied by experiments, dissection of animals and organs, and a certain amount of study of the tissues with the microscope. (The equivalent of one year in the High School.)

10. Botany.—A knowledge of plants and plant-structure and development obtainable from experimental work in connection with Bessey's or Campbell's Botany, or some similar work. (The equivalent of a full year in the High School, of which two-thirds at least should be laboratory work.)

11. Zoology.—A knowledge of the structure and relationships of a number of types of animals, gained by study and dissection of specimens in the laboratory. Marshall and Hurst's Practical Zoology is recommended as a laboratory guide. (The equivalent of a full year in the High School.)

12. Freehand Drawing.—The ability to make a correct outline drawing from a group of geometrical solids. (The equivalent of one year in the High School.)

13. American History.—A thorough knowledge of Sheldon's Studies in American History (Boston, 1891), Thwaite's Colonies (Epochs of American History Series, New York and London, 1891), and Macy's Our Government (revised edition, Boston, 1890). These should be studied in connection topically. MacCoun's Historical Geography of the United States will prove a valuable aid; and for further reading, Fiske's Civil Government, the American Statesmen Series, and the American Commonwealths Series are recommended. (The equivalent of one year in the High School, in addition to the ordinary grammar school course.)

14. History of England.—The equivalent of Gardiner's Student's History of England (New York and London, 1890), and Fonblanque's How We Are Governed. These may be supplemented by readings in Green's History of the English People and the Epochs of Modern History Series. (The equivalent of one year in the High School.)

15. Grecian and Roman History.—The equivalent of Fyffe's History of Greece (History Primers), Allen's Short History of the Roman People (Part II of Allen & Myers' Ancient History, Boston, 1891), and Tighe's Development of the Roman Constitution (History Primers). For further topical study, read the Epochs of Ancient History Series. (The equivalent of one year in the High School.)

16. English Literature.—Complete familiarity, both as to substance and as to form, is expected, with the contents of the books mentioned below. Preparation should embrace questions of grammar, of metre, and of rhetorical form, and some atten-

tion should be given to so much of literary history and biography as naturally connects itself with the works read. Candidates will be tested upon their ability to quote freely and accurately, to paraphrase intelligently, and to outline symmetrically. *Prose*: (*a*) Burke's Speeches on the American War and Letter to the Sheriffs of Bristol, edited by A. J. George; or (*b*) Genung's Rhetorical Analysis, in connection with some such work as A. S. Hill's Principles of Rhetoric. *Poetry*: Hales's Longer English Poems, omitting Shelley's Adonais. *Word Derivation*: The etymological notes to the selections from Spenser and Milton in Hales's Longer English Poems. The derivations in question should all be carefully verified in Webster's International Dictionary. (The equivalent of one year in the High School.)

In 1893, the books prescribed by the University of California under the head of "English 14" will be accepted as equivalents.

17. Spanish.—Monsanto and Languellier's Spanish Course; Knapp's Spanish Readings. (The equivalent of one year in the High School.)

18-19. French.—Whitney's French Grammar, Part I, with written exercises; systematic training in pronunciation; Whitney's French Reader, Parts I and II, or Super's French Reader, Parts I-III (*except M. de Montmartre* and *Le savant et le crocodile*); Souvestre, *Un Philosophe sous les toits* (Fraser); French Composition (Fasnacht, Part I). The equivalent of two years in the High School.)

20-21. German.—A satisfactory preparation will require: the ability to translate easy German prose and verse at sight; an accurate knowledge of the principles of grammar, embracing especially inflections and syntax, the composition of words, the force of prefixes and suffixes, and the relation of the English and the German consonantal changes; also the ability to translate easy prose from English into German. This preparation would be represented approximately, in reading, by Brandt's or Whitney's Reader, and the careful study of one or more modern dramas; in grammar, by Brandt's, Joynes-Meissner's, or Whitney's Grammar; and in German prose, by the first twenty-six exercises in Harris' German Prose Composition. (The equivalent of two years in the High School.)

All applicants are expected to present a statement from their former teacher of the amount of German read and the text-books used.

22-23.—Latin.—The translation of a passage of easy Latin at sight; the principles of Latin Grammar, especially the inflection of nouns and verbs; the first four books of Cæsar's Gallic War; Cicero's four orations against Catiline; the translation into Latin of simple English based on the Cæsar read. (The equivalent of two years in the High School.)

24. Latin.—Cicero's orations, *pro Archia Poeta* and *pro Lege Manilia*; the first six books of Virgil's Æneid, including prosody; and the translation into Latin of a passage of connected English based on Cicero. (The equivalent of one year in the High School.)

Excellence in writing Latin will often compensate for deficiencies in other parts of the examination. The method suggested by Daniell's Exercises in Latin Composition is recommended. The Roman pronunciation is preferred.

25-26. Greek.—Grammar, the inflections, the formation of words, and the essential points of the syntax; Xenophon, Anabasis, books I-IV; Homer, Iliad, books I-II; Prose Composition, ability to write easy connected prose (Allison's text-book is recommended); translation at sight of easy prose. (The equivalent of two years in the High School.)

TIME OF EXAMINATION.

Entrance examinations are held in the following order. For places and dates see calendar, page 5.

First Day.—Physiology, 8:30–10:30: Elementary Algebra, 10:30–12:30; Plane Geometry, 1:30–3:30: English, 3:30–6:00.

Second Day.—Advanced Algebra, Spanish, and Physics, 8:30–10:30; German and Greek, 10:30–12:30; Solid Geometry, English History, and French, 1:30–3:30; Latin (22-23), 3:30–6:00.

Third Day.—Latin (24), Chemistry, and Botany, 8:30–10:30; Trigonometry and English Literature, 10:30–12:30; American History and Zoology, 1:30–3:30; Grecian and Roman History and Freehand Drawing, 3:30–6:00.

Candidates for admission may, if they prefer, take a part of their examinations a year before they propose to enter; but no account will be taken of the result of such

examinations unless at least four subjects are passed. These four subjects may be divided between the May and September examinations at the option of the candidate.

PARTIAL STANDING.

Candidates may be admitted to partial standing in the University upon passing at least *eight* of the required subjects for admission, if in the judgment of the Faculty they are qualified to go on with regular University work. All deficiencies must be made up before a student can be admitted to full standing.

ADMISSION ON CERTIFICATE.

The University does not agree, in advance, to exempt the graduates of any school from all entrance examinations. It will consider, however, recommendations from the principal of any reputable preparatory school, and will waive examination in all entrance subjects fairly covered in the applicant's course of study. Such exemptions are subject to the following conditions:

1. The applicant must have completed a full course in the school and have been duly graduated.

2. The applicant must be specifically recommended by the principal in the subjects in which exemption is granted.

3. The Faculty reserve the right to require an examination in any recommended subject, if for any reason the work done is deemed insufficient or unsatisfactory.

4. *For the present, certificates will not be accepted in entrance subject* 1*b* (*English Composition.*)

Blanks for admission on certificate may be obtained from the Registrar. To insure consideration in season, certificates should be forwarded as early as possible during the summer.

SPECIAL STUDENTS.

Persons at least twenty years of age, who are not candidates for a degree, and who wish to pursue some one study and its related branches, may be admitted as special students, without passing the usual entrance examinations, on the recommendation of the professor under whom the specialty is to be taken. But the professor concerned may impose any test, by examination or otherwise, that he may deem advisable. Candidates are advised to correspond directly with the professor in whose department they desire to work. Blank applications for admission as special students may be obtained from the Registrar.

A failure on the part of any special student to maintain a good standing in the special studies to which he is admitted will at once sever his connection with the University.

ADMISSION TO ADVANCED STANDING.

Students from other institutions of recognized collegiate rank, who present letters of honorable dismissal, may be admitted to such standing and upon such terms as the Faculty may deem equitable. Every such candidate is required to present, along with a catalogue of the institution in which he has studied, a full statement, duly certified, of the studies he has completed, including studies passed or credited at entrance.

Students from other institutions, whose credentials are satisfactory, are usually admitted, without examination, to a minimum standing of one year less than that to which they are entitled at the institution from which they come. At the same time they are admitted to such classes as their preparation seems to warrant. After one semester's residence if their work has been thoroughly successful and of sufficiently high grade, the terms of admission may be readjusted, and such additional credit

given as may then be deemed just by the Faculty ; but no such student can finally be given advanced credit for more than three years' work (ninety hours toward graduation).

REGISTRATION.

At the beginning of each semester each student must register in person at the Registrar's office ; and no student, having been once admitted to the University, will be allowed to register after the close of Registration Day, except by permission of the Faculty. On Registration Day, at the beginning of the collegiate year, students register for the work of the whole year : and no credit will be allowed for work not so registered. Changes in registration can be made only by permission of the Faculty. Students who find it necessary to leave before the close of the year, and who expect to return, and students desiring to be absent for one or more semesters, should obtain leave of absence from the Faculty.

GRADUATION.

The Degree of Bachelor of Arts (A. B.) will be granted to students who have satisfactorily completed the equivalent of four years' work of fifteen hours of lecture or recitation weekly, or a total of one hundred and twenty hours.

It is further provided that each student shall select as his major subject or specialty the work of some one professor. This professor shall have the authority to require such student to complete this *major* subject, and also as *minor* subjects such work in other departments as the professor may regard as necessary or desirable collateral work. Such major and minor subjects taken together will not exceed the equivalent of five recitations per week, or one-third of the student's time for the four years of undergraduate work.

With these exceptions, all the undergraduate work in all the courses is elective. The student may freely choose for such elective work any subject taught in the University, which his previous studies have prepared him to undertake.

The professor in charge of the major subject of any student is expected to act as adviser to the student in educational matters, and the recommendation of such professor is necessary to graduation.

ADVANCED DEGREES

The degree of Master of Arts (A. M.) will be conferred upon graduates of this University, or upon others who have had an equivalent training elsewhere, on the satisfactory completion, in residence, of a year of graduate work, beyond the baccalaureate requirements of the department in which the degree is sought.

In the departments of applied science the professional degrees of Mechanical Engineer (M. E.), Civil Engineer (C. E.) and Chemical Engineer (Ch. E.) will be conferred upon graduates of the corresponding departments of the University, or upon others who have had an equivalent training elsewhere, on the completion with credit of one year of professional study in the departments named, and on the presentation of an approved thesis, showing their ability to do independent work.

The degree of Doctor of Philosophy (Ph. D.) will be granted after the successful completion of an approved course of study of not less than three years after the reception of the Baccalaureate Degree, on the presentation of an acceptable printed thesis which shall embody the results of original research. The degree will be given only on the ground of advanced scholarship and the ability to do independent work in some special line, and

not for merely faithful study for a prescribed time or course, nor for miscellaneous study.

No degree will be granted to any person who has not spent at least one year in resident study at the University. No honorary degrees are given.

EXPENSES OF THE STUDENT.

Tuition in all Departments of the University is free. Students in laboratory courses pay for the materials which they use. The deposits required in advance are different for the different courses, ranging from two to twenty dollars per semester.

The cost of living in Encina and Roble Halls, including board, furnished rooms, light, heat, and attendance, is at present fixed at twenty-three dollars per month. Students furnish their own linen, blankets, towels and napkins. Rooms may be reserved in advance by depositing two dollars with the business agent, Mr. H. G. Snyder.

In the two villages of Palo Alto Park and Mayfield, each about a mile from the University, good rooms and board, in private houses, can be obtained at from eighteen to twenty-five dollars per month. Houses can also be rented for the use of clubs and societies. Good accommodations may also be found in San Jose, Santa Clara, College Park, Mountain View, Menlo Park, Redwood, and other places on the line of the Southern Pacific Railway. Special commutation tickets are issued to students, and the train service is such that students living in these towns can easily go to and from the University daily. Omnibuses connect with all trains at Palo Alto and Mayfield, and special rates are made to students. A careful list of available boarding places outside the Halls, compiled by the Christian Associations, may be consulted at the Registrar's office during the opening week in Sep-

tember, and new students will find no difficulty in securing accommodations after their arrival.

The expenses of the student, exclusive of clothing and railway fares, need not exceed $200 to $275 per year.

SELF-SUPPORT OF STUDENTS.

No provision has been made for affording direct pecuniary assistance to any students, but a considerable number manage in one way or another to earn the whole or a part of their expenses while attending the University. Such opportunities occur in the line of office and laboratory assistance, personal services of numerous kinds, and the management of various student enterprises. Nothing, however, can be promised in advance, and no one is advised to come to the University without resources for at least one semester.

Departments and Courses of Instruction.

GREEK.

Professor MURRAY, and Associate Professor ———

The undergraduate courses in Greek are intended to train the student carefully in the language itself, to acquaint him with the authors studied as representing the great departments of literature, and to enable him to approach intelligently the problems of Greek life and Greek thought. The instruction in the lower classes is given chiefly by means of recitations, but as the student advances these are supplemented by lectures.

It will be seen that provision is made for those who have had no Greek before coming to the University.

1. Elementary. Grammar; translation of easy prose; Greek composition. *Five hours a week, through the year.* Associate Professor ———

After the essential grammatical forms have been mastered passages of continuous prose are taken up for translation and, as soon as is practicable, the Anabasis. The student is made familiar with the ordinary forms of syntax, and at intervals exercises in writing Greek are introduced.

2. Prose Authors. Herodotus, selections; Plato, Apology and Crito; Lysias, select orations. *Three hours a week, through the year.* Associate Professor ———

Course 2 is open to all those who have offered subjects 25–26 on entrance, or who have completed course 1 in this University.

3. Prose Composition and Sight Translation. *Two hours a week, through the year.* Professor MURRAY.

Students in course 2 or course 4 who make Greek their major study, are expected to take this course. Especial attention is paid

to the training of the student to understand ordinary prose in the original.

4. Homer. Selections from the Iliad and Odyssey, with informal talks on the Homeric question. *Three hours a week, through the year.* Professor MURRAY.

Open to those who have completed course 2 or an equivalent.

5. Aeschines and Demosthenes. The two orations on the crown. *Three hours a week, first semester.* Professor MURRAY.

Open only to the more advanced students. The orations will be read rapidly. Careful attention will be paid to the character of Demosthenes as statesman and orator.

6. Thucydides. Selections. *Three hours a week, second semester.* Professor MURRAY.

A continuation of course 5.

GRADUATE COURSES.

The graduate courses in Greek are intended especially for those who are working for advanced degrees or who are looking forward to teaching. They differ from the undergraduate courses, announced above, in that they claim a larger share of the student's time and lead him to a broader and more comprehensive knowledge of the language and literature. He is introduced to higher philological work and is trained through critical studies for original research.

The center of the work is the Greek seminary—made up of the director and such students as satisfy him of their fitness for the work. The seminary meets two hours a week for the critical interpretation of some Greek author, the different members, in turn, filling the post of interpreter. Topics for investigation are assigned, and papers prepared by the members are read and discussed.

Members of the seminary are expected to supplement their critical work by wide reading, and lectures on the author or authors under discussion are given by the

director. A series of practical exercises train the student in rapid translation from Greek into English and from English into Greek, and are of especial assistance to those who expect to become teachers.

7. Greek Seminary. In 1893–94 the work of the seminary will center in Euripides. The Iphigenia Taurica will be taken up for interpretation. *Two hours a week, through the year.* Professor MURRAY.

Students should provide themselves in advance with complete texts of the Greek tragedians and of Aristophanes. [Convenient texts are those in the Teubner series, which may be obtained through B. Westermann & Co., 812 Broadway, New York.]

8. Lectures on Greek Tragedy and Comedy. Supplementing the work of the seminary. Professor MURRAY.

9. Practical Exercises in Translation from Greek into English and from English into Greek. *One hour a week, first semester.* Professor MURRAY.

Graduate and advanced students are recommended to take also the courses in Archæology.

LATIN.

Professor PEASE, and Associate Professors MILLER and ———

UNDERGRADUATE COURSES.

The aim of the undergraduate courses in Latin is to give the student a somewhat systematic knowledge of the language and its development, an acquaintance with the main features of the literature, and some idea of the Roman civilization. The instruction is given chiefly by means of recitations and informal lectures. As the student advances in his Latin studies he is encouraged more and more to make use of the library, and to become familiar with the standard books of reference.

1. Cicero and Vergil. Cicero, three orations; Vergil, six books of the Æneid; exercises in Latin composition. *Four hours a week, through the year.*

This course is planned for those who have passed in entrance subjects 22–23. It is regarded as preparatory to the work required of major students in Latin.

2. Cicero, Livy, and Terence. Cicero, De Amicitia; Livy, books XXI–II; Terence, Andria. *Three hours a week, through the year.* Associate Professor ———

This course is open to students who have passed in subjects 22–23 and 24 of the entrance requirements. After a hurried grammatical review, the chief aim will be to gain as great facility as possible in reading.

3. Translation at Sight and Latin Composition. *Two hours a week, through the year.* Associate Professor ———

This course is open to students who are taking course 2, and is required of major students in Latin. Training in the rapid reading of easy authors will be given one hour a week, and in writing Latin based on the Cicero and Livy of course 2, the other hour.

4. Horace and Tacitus. Horace, selections from the Satires, Odes, and Epistles; Tacitus, Agricola, Germania, and selections from the Annals. *Three hours a week, through the year.* Associate Professor MILLER.

This course, open to those who have passed in course 2, will aim to give a comprehensive view of these authors and their place in the literature. Attention will be directed especially to the subject matter and style.

5. Translation at Sight and Latin Composition. *Two hours a week, through the year.* Associate Professor MILLER.

This is open to students who have taken course 3. In the sight reading, special effort will be made to get at the Roman point of view and to grasp the meaning in the order of the Latin. The exercises for translation into Latin will be prepared to suit the needs of the class.

6. Latin Comedy. *Three hours a week, first semester.* Associate Professor MILLER.

This course will treat of the development of Latin comedy, of the early theatre, and the method of presenting a play. The Menæchmi of Plautus will be studied with particular reference to the early forms, constructions, and metres; and that followed by the more rapid reading of the Captivi, Miles Gloriosus, Trinummus, and the Andria and Adelphoe of Terence.

7. The Letters of Cicero and Pliny. *Three hours a week, second semester.* Professor PEASE.

The aim will be to get a view of Cicero and his times from the original sources, to see some of the causes for the breaking down of the Republic, and to become familiar with official procedure in the judicial and legislative bodies. Special attention will be paid to the familiar style of Cicero's letters, and a few letters of Pliny will be read in contrast.

8. Catullus, Tibullus, and Propertius. *Two hours a week, first semester.* Professor PEASE.

Select poems from these authors will be studied, largely with reference to the thought and artistic form, and compared with similar poems of other writers. Other selections from these authors will be read in translation.

[Course 8, alternating with course 10, will not be given in 1893-94.]

9. Roman Society in the First Century. *Two hours a week, second semester.* Associate Professor MILLER.

Illustrative selections will be read from the Satires of Juvenal and the Epigrams of Martial. Supplementary reading will be assigned in various writers on that period.

[Course 9, alternating with course 11, will not be given in 1893-94.]

10. Lucretius, De Rerum Natura. *Two hours a week, first semester.* Professor PEASE.

Selections will be read in Latin and the rest in translation with reference to the philosophic thought and its poetic treatment.

11. Quintilian. Books X and XII. *Two hours a week, second semester.* Associate Professor MILLER.

In addition to the study of the subject matter of books X and XII, considerable attention will be paid to the history of Roman literature of the first and second centuries, A. D.

12. The Private Life of the Romans. *Two hours a week, first semester.* Professor PEASE.

This course will consist of a series of lectures illustrated with lantern slides and photographs, and supplemented by papers on special topics by the students. It is designed to give a view of the Romans in their home life and daily occupations, and to

familiarize the student with their domestic and social institutions.

13. Greek and Roman Mythology. [See under Archæology, course 2.]

GRADUATE COURSES.

The graduate courses in Latin are intended primarily for students who are looking forward to teaching as their profession. They aim to give a wider acquaintance with the language and literature than is usually afforded in undergraduate courses, and to offer training in philological criticism and in the methods of scientific research. The work centers in the Seminary, a body composed of the director and such graduate students as shall satisfy the director of their fitness for the work; in this, the students present the results of their study in the way of interpretations, reports, reviews, and original papers. The director selects an author or group of authors for the year's work, encourages a wide reading of Latin on the part of the student, usually with some particular end in view, assigns separate portions of the author in hand for minute and critical study as the basis of the interpretations, suggests topics for investigation, guides the members in their private work, and presides at the regular meetings. The work of the Seminary is supplemented by a series of lectures on related subjects.

14. Latin Seminary. In 1893–94 the Seminary will be occupied with the Roman Satirists. Two meetings a week will be devoted to the interpretation of select Satires, and to the discussion of papers presented by the members. Professor PEASE.

[Students should provide themselves in advance with Lachmann's edition of Lucilius, Berlin, 1876, and Harder's Index, Berlin, 1878, or Mueller's edition, Leipzig, 1872; Keller and Holder's Horace, editio minor, Leipzig, 1878; Buecheler's Petronius, Berlin, 1882; and the Jahn-Buecheler edition of Persius, Juvenal, and Sulpicia, Berlin, 1886. It is also desirable to have the following

editions with notes: Kiessling's Horace, Berlin, 1886 ; Gildersleeve's Persius, Harper's, N. Y., 1875 ; and Mayor's Juvenal, 2 vols., Macmillan, N. Y.].

15. The Development of Latin Satire. Lectures. *One hour a week, first semester.* Professor PEASE.

16. Latin Palaeography. Lectures, with practice in reading fac-similes of ancient Mss. *One hour a week, second semester.* Professor PEASE.

17. Practical Exercises in oral and written translation. *Two hours a week, first semester.* Professor PEASE.

18. Latin Grammar. With special reference to the inflections. Lectures. *One hour a week, second semester.* Professor PEASE.

19. A Journal Club will hold regular meetings to report on articles of interest in current periodicals.

ARCHAEOLOGY.

Associate Professor MILLER.

The work will centre around the collections of ancient art in the Leland Stanford Junior Museum. These comprise a vast number of original works and copies from Italy, Greece, and Asia Minor, including a large part of the Cesnola collection from Cyprus. The work in this department will be in the line of the historical development of art.

1. Archaeological Seminary. A special study of individual works of art deposited in the museum. Written theses and informal discussions. *Two hours a week, through the year.* Associate Professor MILLER.

2. Greek and Roman Mythology. A study of the Greek and Roman myths by means of ancient sculptures and vase-paintings. Lectures and recitations, with Seemann's Mythology and Gayley's Greek Myths in English Literature, for collateral reading. *Two hours a week, second semester.* Associate Professor MILLER.

3. History of Greek Sculpture, from the earliest times down to the period of the Diadochi. Lectures. Associate Professor MILLER.

[Course 3 will not be given in 1893–94, but may be expected in 1894–95.]

GERMAN.

Professor GOEBEL, Associate Professor GRIFFIN, and Instructor GRAU.

The aim of the elementary classes in this department is to give the student a thorough knowledge of German grammar and to enable him to acquire the facility in reading German which is necessary in many branches of his studies. The more advanced classes take up the study of the poets and writers of the classical period, and it is intended to offer, by the reading and interpretation of these authors, an equivalent for the study of the ancient languages to those not taking Latin or Greek in their University course. The general responsibility for the language work in this department rests with Associate Professor Griffin; the work in Literature and Philology with Professor Goebel.

1. Elementary. Brandt's German Grammar and German Reader; Harris' German Composition; Bernhardt's Novelletten; translation of easy prose and poetry. *Five hours a week, through the year.* Associate Professor GRIFFIN and Dr. GRAU.

Course 1 is intended for those beginning the study of the language, and is open to all students.

2. Second-year German. Minna von Barnhelm, Gœthe's Prosa, and Maria Stuart. [In 1893–94 Egmont, Schiller's Briefe, and Emilia Galotti will be read.] Advanced grammar and composition, von Jagemann's German Prose Composition, translation at sight. *Three hours a week, through the year.* Associate Professor GRIFFIN.

Open to students who have completed course 1 or its equivalent, or who have received credit for entrance subjects 20–21.

3. Goethe, Lessing, and Schiller. Interpretation of Goethe's Faust, with lectures on the Faustlegend and the history of Goethe's Faust. Schiller: Ueber naive und sentimentalische Dichtung, with lectures on the æsthetic principles of the classical period. [In 1893–94 Goethe's Iphigenie, Lessing's Nathan, and Schiller's æsthetic essays will be read.] *Two hours a week, through the year.* Professor GOEBEL.

Open to students who have completed courses 1 and 2, or their equivalents.

4. Tasso, Faust, Schiller's Briefe ueber die æsthetische Erziehung des Menschen, Fichte's Reden an die deutsche Nation, interpretation and lectures. *Two hours a week, through the year.* Professor GOEBEL.

Open to students who have completed courses 1–3, or their equivalents.

5. Advanced German Composition. White's Prose Composition. *One hour a week, through the year.* Associate Professor GRIFFIN.

Open to students who have completed course 1, or its equivalent.

6. The History of German Literature from Luther to Goethe, with parallel readings (Max Müller's German Classics). *Two hours a week, through the year.* Professor GOEBEL.

Open to students who have completed courses 1 and 2, or their equivalents.

7. Middle-High German. Grammar. Karl Weinhold's Mittelhochdeutsches Lesebuch (first semester.) Das Nibelungenlied, lectures and critical interpretation (second semester). [In 1893–94, Des Minnesangs Frühling and Walther von der Vogelweide will be treated in the second semester]. *Two hours a week, through the year.* Professor GOEBEL.

8. Old-High German. Grammar. Braune's Althochdeutsches Lesebuch, Müllenhoff-Scherer's Denkmäler. *Two hours a week, through the year.* Professor GOEBEL.

9. Gothic. *Two hours a week, second semester.* Professor GOEBEL.

10. German Seminary. For special advanced study and research in the History of the German Language and Literature. *Once a week, through the year.* Professor GOEBEL.

Courses 7–10 inclusive are designed primarily for graduate students, but undergraduates of special attainments may be admitted with the consent of the instructor.

GRADUATE COURSES

The graduate courses in German, for which a thorough knowledge of modern German and the knowledge of Latin at least is required, are intended especially for students who will make the teaching of German their later profession. Careful attention will be given to the linguistic as well as to the literary training of the student, aiming at a comprehensive insight into the historical growth of the Germanic languages and literatures. The scientific methods of original and critical research will be taught and practiced in the seminary. Such students as have given satisfactory proof of their ability as independent investigators will be admitted to the degree of Ph. D., after having presented a thesis containing a contribution to science, and having fulfilled the other requirements prescribed by the University.

ROMANCE LANGUAGES.

Professor TODD, Assistant Professor BRUN, and Assistant DUQUE.

1. Elementary French. Whitney's Practical French Grammar, Part I, with written exercises, and training in pronunciation; Whitney's Introductory French Reader, Parts I and II; Souvestre, *Un Philosophe sous les toits* (Fraser); French Composition (Fasnacht, Part I). *Five hours a week, through the year.* Assistant Professor BRUN.

In this course the study of the language is taken up from the beginning. Stress is laid upon the acquisition, theoretically and practically, of a correct pronunciation, but no direct attempt is made to teach French conversation. The student's entire energy is concentrated upon the attainment of a full and accurate reading knowledge of the language, to which end grammar and composition are made systematically to contribute. Open to all students.

2. Modern French Authors. *a.* Sandeau, *Mlle. de la Seiglière* (Warren); Mérimée, *Colomba* (Fontaine); De Vigny, *Cinq-Mars* (Owen's notes); Modern French Lyrics (Bowen); Whitneys' Grammar, Part II. (First semester.) *b.* Victor Hugo and Romanticism: *Les Travailleurs de la Mer* (Owen's notes); *Hernani* (Matzke); *Le Romantisme Français* (Crane). French Composition (Fasnacht, Part II). (Second semester.) *Three hours a week, through the year.* Professor TODD.

A course in rapid reading and introduction to the modern literature. In connection with the authors read, twenty-minute talks on literature will be given, on the basis of Saintsbury's Primer of French Literature. Open to students who have completed course 1, or who have received credit for entrance subjects 18–19.

3. French Classical Authors. Corneille, *Le Cid*, *Horace*; Racine, *Athalie*, *Andromaque*; Molière, *Le Bourgeois gentilhomme*, *Les Précieuses ridicules*, *Les Femmes savantes*. Comparative study of these authors, with lectures on the literature of the 17th century. *Three hours a week, through the year.*

Open to students who have completed course 2, or its equivalent.

4. Elementary Spanish. Monsanto and Languellier's Spanish Course; selections from Spanish Authors (Knapp's Spanish Readings). *Two hours a week, through the year.* Mr. DUQUE.

Open to all students.

5. Advanced Spanish. Valera, *Pepita Ximenez*, with exercises in composition, based on select passages; Calderon, *La Vida es sueño*; Lope de Vega, *Comedias*; Cervantes, *Don Quijote*. *Three hours a week, through the year.* Mr. DUQUE.

Open to students who have completed course 4, or who have received credit for entrance subject 17.

6. Elementary Italian. Grandgent's Italian Grammar and Italian Composition; Selections from Italian Authors (Harper's *Principia*), Fenini, *Letteratura italiana;* Manzoni, *I Promessi Sposi*. *Three hours a week, through the year.* Professor TODD.

Open to all students.

Courses 1 to 6 were given in 1892–93; the list will be revised for 1893–94.

GRADUATE COURSES

Courses of instruction for graduate students in Romance philology and literature lead to the degrees of Master of Arts and Doctor of Philosophy, and are planned for the benefit of specialists, particularly of such as are looking forward to becoming college teachers of the Romance languages. Admission to regular standing in this department presupposes an undergraduate curriculum of study which has included Latin and French, and has afforded proficiency in at least one of the principal languages of the Romance group (French, Spanish, or Italian). In addition to this, a good reading knowledge of German (for purposes of advanced study) is requisite. Candidates satisfying these requirements may devote themselves to special studies in Romance philology, under the systematic daily instruction and guidance of the professor, and to the preparation of papers involving critical investigation and original research. In connection with this special work, graduate students will be expected to take, under the advice of their professor, such undergraduates courses in the Romance languages as may supplement their previous studies, and also such graduate courses in kindred subjects as will serve to broaden their general acquaintance with philology and literature.

ENGLISH LITERATURE AND LANGUAGE.

Professors ANDERSON and FLÜGEL, Associate Professor HUDSON, and Assistant Professors SAMPSON, NEWCOMER, and LATHROP.

The aims of the courses in English are: (1) To give training in the formulation and expression of thought; (2) to impart a scientific knowledge of the English Language and of literary history, English and European; (3) to acquaint the student with a juster and more

liberal method of literary criticism; (4) to introduce him to literature as an art,—to cultivate a refined appreciation of what is best and thus to reveal unfailing sources of pure enjoyment.

Every one of the courses subserves more or less distinctly one or more of these aims; some perhaps subserve them all. In selecting courses the student should observe some system, accordingly as he desires to give greatest prominence to literature, philology, or composition. While no candidate for graduation in English will be permitted to neglect any one of these three phases of English study, every such candidate must do special work in one of the three. At the beginning of each year, every student making English his major subject must present to the Faculty of the English Department a list of the studies for which he proposes to register. No candidate whose course is unsatisfactory to the Department will be recommended for a degree.

A good reading knowledge of the chief modern European languages, especially French and German, is requisite for some of the more advanced courses and is desirable for all. Students intending to make English their major subject are advised to offer one or more languages, ancient or modern, for entrance, and to continue these subjects in the University. Students entering without such preparation are advised to begin the study of these languages as early in their course as possible. Students making a specialty of English philology will find a knowledge of Latin indispensable.

For graduation in English at least forty hours of work in this department are required, *i. e.*, five hours of work per week for eight semesters. After 1893, no student will be considered a candidate for the bachelor's degree in English, until he shall have creditably performed a certain amount of work both in the Philological Seminary

and in the Literary Seminary, and shall have passed satisfactorily in courses 8, 10, 23, 24 or 27, 25, and 26.

Courses 3, 4, and 12 are open to students who have received credit for entrance subject 1 *a*; for all other courses 1 *b* will be required. In no case will a student be admitted to an advanced course without permission from the instructor.

The undergraduate course known as English 1 will not be given after 1892–93. The proficiency in composition heretofore required in this subject will now be necessary in order to satisfy entrance requirement 1 *b*. Students admitted to the University with a condition in 1 *b* will be given an opportunity to make up the condition under private tutors approved by the Professor of English Literature; and it is recommended that such students take but thirteen hours per week in the University pending the removal of this condition.

In order to enter the University as a Special Student in English, the applicant must be at least twenty years of age (see p. 35) and must satisfy entrance requirements 1 *a* and 1 *b*.

UNDERGRADUATE COURSES.

1. English Composition. A systematic course in theme-writing and rhetorical analysis. *Two hours a week, through the year.* Assistant Professors NEWCOMER, SAMPSON, and LATHROP.

[Course 1 will not be given after 1892–93. See the general remarks above and the statement of the requirements for admission to the University (English 1 *a* and 1 *b*, p. 29)].

2. Introduction to the Study of English Literature. Lectures and Discussions. *Two hours a week, through the year.* Assistant Professor LATHROP.

[Course 2 will not be given in 1893–94.]

3. English Prose Writers of the Nineteenth Century: Macaulay, De Quincey, and Carlyle. Lectures, Discussions, and Reports, written and oral. *Three hours a week, first semester.*

Associate Professor HUDSON, and Assistant Professors SAMPSON and LATHROP.

4. English Prose Writers of the Nineteenth Century: Landor, Lamb, Newman, Thackeray, Matthew Arnold. *Three hours a week, second semester.* Associate Professor HUDSON, and Assistant Professors SAMPSON and LATHROP.

5. Elocution. Voice culture, gesture, reading and interpretation of classic orations and essays.

[Course 5 may not be given in 1893–94.]

6. Logic. Jevons's Elements. *Two hours a week, first semester.* Assistant Professor NEWCOMER.

[Course 6 will not be given in 1893–94.]

7. Poetics. Gummere's Handbook of Poetics, Corson's Primer of English Verse, and lectures on classical and modern verse. *Two hours a week, second semester.* Assistant Professor NEWCOMER.

[Course 7 will not be given in 1893–94.]

8. English Composition. Three themes a week and an essay every two weeks. *Two hours a week, through the year.* Assistant Professors NEWCOMER and LATHROP.

9. Forensics. Practice in argument, oral and written, and in the preparation of briefs based upon the masterpieces of argumentative style. *Two hours a week, through the year.* Assistant Professor LATHROP.

[Course 9 will not be given in 1893–94.]

10. Anglo-Saxon. *Two hours a week, through the year.* Professor FLÜGEL.

a. Anglo-Saxon Grammar and Translation of Select Passages in prose and verse (first semester). *b.* Introduction to the Study of Anglo-Saxon Literature (second semester). *b* is a continuation of *a*, but open to all students who have satisfied the professor of their fitness. For both *a* and *b* some knowledge of either German or Latin is a pre-requisite.

[The text books used in 1892-93 were Sievers's Old English Grammar (Angelsächsische Grammatik, 2d ed. 1886) translated by Cook (second ed. 1887); Bright's Anglo-Saxon Reader; Ten Brink's Early English Literature, translated by Kennedy.]

11. English Composition. An advanced course, open only to students who have distinguished themselves in course 8. *Two hours a week, through the year.* Assistant Professor SAMPSON.

This course is especially intended as an introduction to journalism, book reviewing, and other forms of literary work.

12. The English Bible, including the Apocrypha, and Homer studied from translations, as an introduction to English literature, especially to Spenser and Milton. *Two hours a week, first semester.* Assistant Professor NEWCOMER.

13. Vergil and Dante, studied from translations, as an introduction to English literature, especially to Spenser and Milton. *Two hours a week, second semester.* Assistant Professor NEWCOMER.

14. The Classical Drama, studied from translations, as an introduction to Shakspere. *Three hours a week, first semester.* Assistant Professor SAMPSON.

15. Shakspere as a Dramatic Artist. An inductive study of methods of dramatic construction. *Three hours a week, second semester.* Assistant Professor SAMPSON.

16. *a.* **The Pre-Shaksperian Drama** in England. (First semester.) *b.* **The Spanish, Italian, and French Drama.** Studied as an introduction to the English drama. (Second semester.) *Two hours a week, through the year.* Associate Professor HUDSON.

Open to those only who are familiar with at least one foreign language.

[Course 16 will not be given in 1893–94.]

17. The Poets of the Sixteenth and Seventeenth Centuries, from Tottel's Miscellany to the death of Dryden. In this course Spenser, Shakspere, and Milton will be treated only incidentally. Lectures and discussions. *Three hours a week, through the year.* Assistant Professor LATHROP.

18. The Literature of the Eighteenth Century. Lectures and discussions. *Three hours a week, through the year.* Associate Professor HUDSON.

19. Contemporary Literature. A comparative study of the Chief Movements and Tendencies of Contemporary Liter-

ature. Lectures will be given, topics for special research assigned, and reports required, which will be discussed by class and instructor. *Two hours a week, through the year.* Associate Professor HUDSON.

Open to those only who are familiar with at least one foreign language.

20. Novelists of the Nineteenth Century. *Two hours a week, second semester.* Associate Professor HUDSON.

[Course 20 will not be given in 1893–94.]

21. American Literature. Lectures and discussions based upon Richardson and Stedman. Students in this course are expected to possess the works of the chief American poets, especially Lowell, Longfellow, Whittier, Bryant, Poe, and Lanier. *Three hours a week, through the year.* Assistant Professor NEWCOMER.

22. Old and Middle English Grammar. *Two hours a week, second semester.* Professor FLÜGEL.

Open only to students who have completed course 10. [Sweet's Short Historical English Grammar will be of advantage to the student.]

23. Chaucer. *Two hours a week, first semester.* Professor FLÜGEL.

This course is an elementary one, and includes an outline of Middle English Grammar for the beginner. The Textbooks are Sweet's Second Middle English Primer, Morris and Skeat's Edition of the Prologue, The Knightes Tale, The Nonne Preestes Tale. To students desiring to make a fuller study of Chaucer opportunity will be given for courses of private reading under the supervision of the Professor.

[In 1893–94 Piers the Plowman and Wycliffe will be read.]

24. Spenser. A critical examination of his chief poems with special reference to their literary and ethical qualities, and to the influence of Spenser upon other poets. *Three hours a week, second semester.* Professor ANDERSON.

Open to students who have distinguished themselves in courses 12 and 13, and in at least one other English course.

[Course 24 and course 27 will be given in alternate years. In 1893–94 course 24 will be omitted.]

25. Milton. A critical examination of his chief works in the light of his life and times, with an attempt to realize his character and to appreciate the classical quality of his poetry. *Three hours a week, first semester.* Professor ANDERSON.

Open to students who have distinguished themselves in courses 12 and 13, and in at least one other English course.

26. Shakspere. A study of selected plays involving a critical collation of some of the quartos and folios, a study of the characters, an analysis of the author's dramatic methods, and an examination of other sources of his literary power. *Three hours a week, through the year.* Professor ANDERSON.

Open to students who have distinguished themselves either in courses 14 and 15, or in 16. As this course is necessarily based largely upon Furness's "Variorum Shakespeare," the student is requested to provide himself with at least two volumes of this edition, and those who can afford it are advised to procure the whole set. The work next in importance to the student is Schmidt's "Shakespeare Lexicon."

27. English Poetry of the Nineteenth Century. Reading and interpretation of characteristic works of Wordsworth, Byron, Shelley, Keats, Coleridge, Tennyson, Arnold, and Swinburne. *Three hours a week, second semester.* Professor ANDERSON.

Open to students who have distinguished themselves in courses 12 and 13, and in at least one other English course. The student is requested to provide himself with a good edition, in one volume, of each of the poets mentioned above. [Course 27 and course 24 will be given in alternate years.]

GRADUATE COURSES.

In addition to the following courses, opportunity will be afforded to graduate students to pursue lines of reading and investigation under the guidance of the professors. It is proposed to offer courses leading to the Doctor's degree, but as the requirements for the degree must vary with every individual, no very definite announcement can be made in advance. In no case will the degree be conferred except upon the completion of a thesis embody-

ing the results of original work of a high order. More definite information will be furnished by the members of the English staff to intending students who write giving the necessary information respecting their purposes and equipment. A very large proportion of the undergraduate courses, especially courses 10 and 11 and courses 16 to 27 inclusive, are adapted to the needs of graduates of other colleges, and are earnestly recommended to candidates for advanced degrees.

28. Philological Seminary. Professor FLÜGEL.

a. *Pro-Seminary Courses:*—1. Introduction to the study of the Anglo-Saxon Laws with Interpretations (first semester). This course presupposes no knowledge of Anglo Saxon. A short outline of Anglo Saxon grammar will be given for beginners. 2. Introduction to the Study of Old and Middle English Literature (second semester). *Two hours a week, through the year.* Open only to students who have satisfied the Professor of their fitness for the work.

b. The meetings of the *Seminary* will be devoted to special studies. The details will be arranged by the Professor and the applicants. The special studies will consist of interpretations, reports and papers; original work will be embodied in theses that may be presented for the Doctor's Degree. For 1893–94 a course of special studies on *Beowulf* and the *History of Early English Metres* (Anglo Saxon, Old and Middle English) is contemplated. An additional course will be given on *Early English Palæography* during the second semester. For these courses a good reading knowledge of German is required. *Two hours a week, through the year.*

29. Literary Seminary. Professor ANDERSON and Associate Professor HUDSON.

a. *Pro-Seminary Courses*:—1. Dramatists contemporary with Shakspere. This is chiefly a reading course intended to familiarize students of Shakspere with the masterpieces of such writers as Marlowe, Ben Jonson, Beaumont and Fletcher, Webster, Chapman, Dekker, Marston, Middleton, Ford, etc. With an application of the inductive criticism. *Two hours a week, through the year.* Professor ANDERSON. Open to students in

course 26. 2. The Development of the Modern Novel. *Two hours a week, through the year.* Associate Professor HUDSON. Open to students of distinction in courses 18 and 19.

b. In 1892–93 the *Seminary* was devoted to the study of Nineteenth Century Poetry, considered as the emotional expression of modern thought. In 1893–4, either a course of special studies in the Elizabethan Dramatists, or a Comparative Study of Tennyson and Browning, will be offered. *Two hours a week, through the year.* Professor ANDERSON.

PSYCHOLOGY.

Professor ANGELL.

1. Elementary Psychology. Recitation, lectures, and preparation of abstracts. *Three hours a week, second semester.* Professor ANGELL.

Ziehen's Physiological Psychology will serve as a basis for the course. A reading knowledge of German, and an acquaintance with the general laws of physics and physiology, will be of great help in this course.

2. Advanced Psychology. Lectures and preparation of abstracts and essays. *Three hours a week, first semester, one hour a week, second semester.* Professor ANGELL.

Wundt's Vorlesugen über die Menschen and Thierseele will be used as a basis of reference. Open to those who have completed course 1, or its equivalent.

3. Introduction to Experimental Psychology. *One hour a week, through the year.* Professor ANGELL.

To be taken in connection with course 2.

4. Laboratory work in Experimental Psychology. Professor ANGELL.

The amount of work to be done in this course will depend on the conveniences and equipment of the laboratory. The minimum amount of required work will probably be six hours, of which two will be equivalent to one hour of recitation. In connection with this a seminary of two hours fortnightly will probably be arranged.

To be taken in connection with course 2. A knowledge of German and physics is required.

ETHICS AND ETHICAL LITERATURE.

Associate Professor GRIGGS.

The aim of this department is the inductive study of ethical conduct and ethical ideals. No attempt will be made to construct an abstract metaphysical or theological theory of life; but on the contrary, the effort will be to find, by scientific investigation, the laws and tendencies actually ruling in the complex world of human life, and to study the evolution of moral ideas and moral conduct. The texts are the facts of ethical conduct, belief, and theory,—past and present. Literature, as giving a study and interpretation of the deepest ethical problems, and as embodying the life of the past, is recognized as one of the most important means for the inductive study of ethics.

1. Introduction to the Study of Ethics. Lectures. *Two hours a week, first semester.* Associate Professor GRIGGS.

The purpose of this course is to discuss the general questions involved in the study of Ethics; and to introduce the student to the principles and methods of the science of Ethics. Such subjects as the following will be discussed: The Inter-relation of Belief and Conduct; The Relativity of Ethical Ideals; The Forces Determining Change and Development in Ethical Ideals; Practical Methods in the Study of Ethics; Present Problems in Ethics.

2. Spiritual Teachers of the Nineteenth Century. *Three hours a week, first semester.* Associate Professor GRIGGS.

A study of selections from Shelley, Wordsworth, Carlyle, Emerson, Browning, and Tennyson, with reference to their ethical and spiritual teachings, and the application of these to questions of daily life.

3. The Philosophy of Literature. Lectures. *Two hours a week, second semester.* Associate Professor GRIGGS.

A discussion of the nature, sources, and relations of Literature; and of the principles involved in the study of Literature from the philosophical point of view. Among the topics discussed

will be the following: The Material of Literature; Literature and Other Arts; The Forces behind Literature; The Lines of Study of Literature; The Attitude of Mind necessary in the Study of Literature; Art Masterpieces of Literature.

4. The Ethical Literature of the Bible. *Three hours a week, second semester.* Associate Professor GRIGGS.

Selections from both the Old and New Testaments will be studied purely from the ethical and literary points of view. No attempt will be made to construct or discuss theological doctrines. The object will be to understand the ethical teachings and appreciate the literary excellence of the Bible; to trace the evolution of Hebrew thought in connection with Hebrew life; and to find the relation of the thought of both the Old and New Testaments to present life.

5. Dante: A Study of the Divine Comedy. *Three hours a week, first semester.* Associate Professor GRIGGS.

6. Goethe: A Study of Faust. *Three hours a week, second semester.* Associate Professor GRIGGS.

The masterpieces of Dante and Goethe will be taken up as great concrete studies of human life, involving ethical problems of vast and permanent importance; and embodying the life of the epochs and men that produced them. A comparison will be made between the mediæval and modern views of the problems of sin and soul-development.

7. The Evolution of Ethical Conduct and Ethical Ideals. Lectures and special studies. *Two hours a week, second semester.* Associate Professor GRIGGS.

The aims of this course will be: (1) to trace the evolution of moral ideas and moral practice; (2) to find the inter-relation between ideals and conduct; (3) to seek the sources of moral ideas, and all the varied causes, physical, social, and spiritual, producing change in both moral ideas and moral practice; (4) to determine the line of growth of human life, and obtain some view of the value of present ideals and present practice.

8. Seminary for the Study of Ethical Theories. *Two hours a week, first semester.* Associate Professor GRIGGS.

Each year some one philosopher will be selected and his works critically studied, to determine his ethical theory in relation to other theories of conduct, to find the sources of his theory and

its relation to contemporaneous practical life, and to find its relation to ideals and conduct to-day.

The subject for 1893–94 will be Plato.

9. Seminary for the Study of Ethical Problems. *Two hours a week, second semester.* Associate Professor GRIGGS.

Each year some one ethical problem will be selected and studied as exhaustively as possible. The selection will be from such problems as the following: 1. The influences of changes in theological and religious belief on the conduct of individuals and epochs. 2. Heredity as a factor in determining belief and conduct. 3. The influence of environment, physical and social, in determining ethical belief and practice. 4. The sources of pessimism. 5. The practical effects of a reaction against conventional moral standards.

The subject for 1893–94 will be The Sources and Causes of Pessimism. Special topics will be assigned for investigation. These will include: (1) the various pessimistic systems and theories; (2) the studies of pessimistic characters in literature; (3) the conditions under which pessimism has arisen among individuals, epochs, and races.

PHILOSOPHY.

1. History of Philosophy. *Two hours a week, through the year.* Professor EARL BARNES.

2. Ethics. A critical study of Herbert Spencer's Data of Ethics. *Two hours a week, through the year.* Associate Professor HUDSON.

[Course 2 will not be given in 1893–94.]

3. Laws of Organic Life. Heredity, variability, response to external stimulus, etc., with a review of the theories of evolution; critical studies by the students of the chief works bearing on the subject; the writings of Darwin, Wallace, Spencer, Weissmann, Agassiz, Cope, Lankester, and others. *Three hours a week, first semester.* President JORDAN.

EDUCATION.

Professor EARL BARNES.

1. History of the Development of the European Intellect. *Two hours a week, through the year.* Professor EARL BARNES.

This course will trace the successive ideals of manhood and womanhood that have appeared in the historic period; will ask how these ideals arose, how the people tried to perpetuate them and with what success. It will be a study in the history of education in its broadest sense. The work will consist of studies on such records as are available in the library, and on Leaflets specially prepared for the course, with occasional lectures. In 1892–93 special lectures were given in this course by Mr. Hermann Krüsi and Miss Emma Marwedel.

2. The Intellectual Development of America. *Two hours a week, through the year.* Professor EARL BARNES.

This course will deal with the successive steps in our intellectual development as shown in our schools, literature, journals, and social and theological movements. The work will be presented in special studies and lectures, and will be given with special reference to the development of educational ideas.

3. Studies on Children. *Two hours a week, through the year.* Professor EARL BARNES.

This course will deal with the physical, intellectual, and moral development of children. The work will consist of original studies on the children in the Kindergarten connected with the department, or on children otherwise available, of statistical studies on data concerning the development of the senses, emotions, etc., collected from various schools, and of studies in the literature of the subject. To take up this work intelligently students should have had at least an elementary course in psychology.

4. School Organization and Management. *Two hours a week, second semester.* Professor EARL BARNES.

This course is intended only for those who expect to teach. It will consist of a comparative study of existing school systems, with a view to determining the best plans for organizing and managing schools of various sorts. More than 3,000 reports,

catalogues, and courses of instruction are already collected as a basis for this work.

5. Comparative study of European School Systems. *One hour a week, second semester.* Professor EARL BARNES.

This course will consist of lectures and comparative studies on the school systems of England, France, Germany, and Switzerland. Students in this course should have a reading knowledge of French and German.

6. Rousseau and Pestalozzi. Historical and critical study of Rousseau's *Emile* and Pestalozzi's *Lienhard und Gertrud. Two hours a week, through the year.* Professor EARL BARNES.

This course is intended for those who wish to study these works, and at the same time to strengthen their use of French and German.

7. Methods of Teaching Subjects in Secondary Schools. *Two hours a week, first semester.* Professor EARL BARNES.

In this course a series of lectures and lessons will be given by various members of the faculty outlining the place of their various subjects in a course of liberal study, and dealing with text-books, class room management, and general questions of method. It is believed that men who have made a special study of their departments can present work which will be of assistance to those intending to teach.

[**8. School Hygiene, Anthropometry, and Physical Training.** See course 3 in Department of Physical Training and Hygiene.]

[**9. Teacher's Course in General Physiology.** See course 7 in Department of Physiology.]

10. Seminary for the study of special educational questions. *Two hours a week, through the year.* Professor EARL BARNES.

The seminary is intended only for advanced students who wish to make an extended study in some subject.

Students in this department will be required to take work in psychology, unless they are already well grounded in that subject. Experimental work with children will also be required. Special work will be arranged for graduate students. Teachers

not candidates for a degree, but wishing to carry on special studies in the department, will be given every facility for doing such work.

HISTORY.

Professor HOWARD, Associate Professor SHOW, Assistant Professor MARY SHELDON BARNES, and———.

UNDERGRADUATE COURSES.

1. History of Rome. From the earliest times to the fall of the Western Empire, with special reference to institutions. *Three hours a week, through the year.* Associate Professor SHOW.

Course 1 is open to all students, and is required of first year students in History. It is designed to afford a general training in scientific method. The systematic use of books is had constantly in view. In class the work consists of informal lectures, critical discussions, and written reviews. During the year, in addition, every student is expected to present before the class oral or written reports on subjects assigned for special reading.

2. Mediæval Institutions. *Two hours a week, through the year.* Associate Professor SHOW.

Course 2 is open to second year students, and is designed to continue the work done in course 1. Beginning with the later imperial organization, it will trace the main development of European institutions from the fifth to the fifteenth century, with special reference to the Germanic polity, feudalism, and the rise of the great modern states. Themes and analyses will be expected from time to time. Some attempt will be made also, to acquaint the students with proper methods of handling the original sources of the mediæval period.

3. History of the Nineteenth Century in Europe. *Two hours a week, first semester, and first half of second semester.* Assistant Professor MARY SHELDON BARNES.

Course 3 is open to all who have had course 1, or to those who, in the judgment of the professor in charge, have sufficient preparation for the work. Special arrangements will be made with those who wish to do special work. The course will afford a general view of the political and colonial development of Europe

from the close of the French Revolution to the present day. Studies will be made from the sources, and special attention will be paid to historical geography, and to methods of historical study. The work will be given in the form of lectures, discussions, and reports on special topics. Text books required, Müller's History of Modern Times, and Putzger's *Historischer Schul-Atlas.*

4. Historical Development of the Pacific Slope. *Two hours a week, second half of second semester.* Assistant Professor MARY SHELDON BARNES.

Course 4 is open to all students. It will consist of a series of lectures, giving a general view of the subject in its larger connections, during the Spanish, Mexican, and American periods. The work of the class will consist in reports on special topics, studies set on leaflets from the sources, and in readings.

5. Church and State in the Middle Ages. *Two hours a week, first semester.* Associate Professor SHOW.

Course 5 is open to graduates and undergraduates who have taken course 2 or its equivalent. It will consider the primitive constitution of the church, the rise of the papacy, the monastic institutions, the theory of the Holy Roman Empire, the conflicts of the church and the civil power, and similar topics. Students will be guided in research work upon selected topics.

6. History of the Protestant Reformation. *Two hours a week, second semester.* Associate Professor SHOW.

Course 6 is open to all students who have had course 2 or its equivalent. It will deal with the Protestant movement in the various European states, in its political, intellectual, and ecclesiastical relations, tracing its history to the close of the Thirty Years' War.

7. American Political and Institutional History to 1775. *Two hours a week, through the year.*

Course 7 is open to third year students. Without excluding other topics, it is devoted mainly to the constitutional history of the English colonies. The origin and development of the various types of local organization receive special attention. An attempt is made, in this period, to trace the beginnings of our present State and National Constitutions. Reports and themes are required.

8. Constitutional and Political History of the United States since 1775. *Three hours a week, through the year.* Professor HOWARD.

Course 8 is open to graduates and to undergraduates who have had courses 1 and 2, or their equivalent. It should, when practicable, be preceded by course 7. It is a study of the Revolution, the Critical Period, and the formation and development of the National Constitution. Attention is given to the various types of local organization. Students are expected to prepare reports and themes showing the results of independent research and comprising extended bibliographies. One or two hours extra credit will be given for such supplementary work. This course is important as a preparation for the study of law.

9. History of the English Constitution since Henry VII. *Two hours a week, through the year.* Professor HOWARD.

Course 9 is open to graduates and to advanced undergraduates. It is designed to afford a detailed study of the growth of the English Parliament and the Cabinet system. Particular attention is given to the constitutional results of the Puritan Revolution, and to the existing forms of local government and administration. Reports and themes are required as in course 8. One or two hours extra credit for independent work. This course is also important as a preparation for the study of law.

10. History of England to 1485. *Two hours a week, through the year.*

Course 10 is open to students who have had course 1 or its equivalent.

11. History of Europe in the **17th and 18th Centuries.** *Three hours a week, through the year.*

Course 11 is open to students who have had courses 1 and 2, or to those who are deemed qualified by the professor in charge.

12. The French Revolution, with special reference to its causes, and its constitutional experiments. *Two hours a week, through the year.* Professor HOWARD.

Open to students having a fair knowledge of French and general European history.

GRADUATE COURSES.

The courses offered to graduate students are especially designed to afford a training in methods of historical research, through the use of original materials. The results of such investigations are presented in the seminary to which these courses are tributary. No attempt, however, is made sharply to separate the undergraduate from the graduate department. Graduates will often find it to their advantage to take courses designated for undergraduates; while undergraduates with adequate preparation may, by invitation of the professor, be admitted to courses primarily designed for graduates.

13. Seminary in Institutions. *Two hours a week, through the year.* Under direction of Professor HOWARD.

The investigation of special questions in English and American constitutional history.

14. Seminary in Mediæval Institutions. *One hour a week, through the year.* Associate Professor SHOW.

Course 14 is designed especially to supplement course 5, and is open to such students in that course as may be found qualified and to graduates. The work will consist mainly in the reading and interpretation of mediæval Latin texts.

15. Seminary in Modern European History. *One hour a week, through the year.*

Course 15 is open to graduates and to those taking course 11 who are deemed qualified by the professor.

16. Seminary course in the development of the Pacific Slope. *One hour a week, through the year.* Assistant Professor MARY SHELDON BARNES.

Course 16 is open to graduates and to undergraduates who, having had course 4, seem otherwise qualified to pursue this work. It will consist in studies from original sources on special topics selected by the Seminary, connected with the development of the Pacific Slope.

ECONOMICS AND SOCIAL SCIENCE.

Professors WARNER and Ross, and Assistant Professors F. C. CLARK and ELLIOTT.

I. POLITICAL ECONOMY, STATISTICS, AND FINANCE.

1. Elements of Political Economy. Walker, or some other text is systematically studied the first semester. The second semester there are frequent lectures by the instructor, reports on assigned topics by the members of the class, and collateral reading, especially in Mill and Marshall. *Three hours a week, through the year.* Assistant Professor F. C. CLARK.

Students who take as their major any branch of the work in this department should begin with course 1. Only in exceptional cases will a student be allowed to take other work in this department until he has completed at least the first half of course 1.

2. Economic Reforms of To-day. Lectures. A study of the signs and causes of existing discontent; of the nature, benefits, and evils of the industrial revolution; of the complaints of the farmer, the workingman, and the consumer; and of the various reforms demanded on their behalf. *Three hours a week, first semester.* Professor Ross.

3. History of the Development of Industrial Society. Lectures and recitations. *Two hours a week, second semester.* Assistant Professor F. C. CLARK.

Course 3 presupposes a knowledge of English History.

4. Corporate Industry. A comparative and historical review of corporation law in its economic aspects. The work of the first semester will be complete in itself, but is designed as a preparation for the study of Railroad Problems, or the work of the second semester, which will be conducted by seminary methods, special reports involving original research being required of the students. Lectures, *three hours first semester, two hours second semester.* Professor WARNER.

5. Seminary. Pure Economics. Investigation and theses. Comparative and historical study of doctrines, recent theories, especially those of Menger, Böhm-Bawerk, Clark, and Patten.

Reports and discussions on current economic literature. *Once a week, through the year* (two hour session). Professor Ross.

6. Public Finance. Lectures and recitations. This course includes taxation, financial administration, and public debts. Bastable, Ely, and Adams will be used in class, and frequent reference will be made to the treatises of Wagner, Cohn, and Leroy-Beaulieu. *Three hours a week, second semester.* Professor Ross.

Course 6 should be preceded by course 1.

7. Tariff History of the United States. Lectures, reports, and discussions. *Three hours a week, second semester.* Dr. Elliott.

Open to students who have taken or are taking course 1, or who have completed at least one course in history.

8. Socialism. Ely's French and German Socialism, with collateral readings. *Two hours a week, first semester.* Assistant Professor Clark.

Course 8 must be preceded by courses 1 and 2.

9. Railroad Problems. Lectures. Extensive use will be made of the Hopkins Library of railroad literature. *Two hours a week, first semester.* Assistant Professor Clark.

10. Theory and Technique of Statistics. Lectures. Smith and Meitzen. *One hour a week, through the year.* Assistant Professor F. C. Clark.

Course 10 must be preceded by course 1. It may accompany courses 7 and 9.

II. SOCIOLOGY.

11. Anthropology and Ethnology. Text, collateral reading, and lectures. *One hour a week, through the year.* Assistant Professor F. C. Clark.

[The work of the second semester will be devoted mainly to studies and investigations in American prehistoric sociology.]

12. Statical Sociology. Lectures. Based on Spencer, Schäffle, and others. Study of the growth and meaning of institutions. Analysis of contemporary society. *Two hours a week, first semester.* Professor Ross.

13. Dynamic Sociology. Lectures. Based on Comte, Ward, and Gumplowicz. Study of the social forces and their direction. The nature of social progress and the forces that sustain and oppose it will be investigated with a view to ascertaining its laws. *Two hours a week, second semester.* Professor Ross.

14. Social Pathology. Lectures and assigned reading. A study of abnormal conditions and the social causes and effects of vice, crime, and pauperism. *Two hours a week, first semester.* Professor Warner.

15. Charities and Correction. Supplementary to course 14, being a study of social therapeutics. So far as practicable visits will be made by the class to the charitable and penal institutions of the State. *Two hours a week, second semester.* Professor Warner.

III. POLITICAL SCIENCE.

16. The State. The origin and historical development of the State. Comparison of contemporary constitutions. The structure and functions of the modern State. *Two hours a week, through the year.* Professor Ross.

17. Methods of Legislating. A comparative view of the rules and practice of modern legislative assemblies, with special reference to the machinery of congressional and legislative action in the United States. *Three hours a week, first semester.* Professor Warner.

18. Administration in American Cities, Counties, and States. A comparative view of the local governments of the present time, with special reference to American practice in the administrative branches. *Three hours a week, second semester.* Professor Warner.

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19. Department Seminary. The instructors in the Department of Economics and Social Science will meet graduates and other advanced students doing original work once a week during a session of two hours. Reports of special investigations will be made by students and others, and discussed by the seminary.

LAW.

Non-Resident Professor HARRISON, and Professor ABBOTT.

The department of law will conform in all respects to the other departments of the University. The requirements for admission will be the same; the courses will be open for election as major or minor subjects the same as in other departments; the same degree will be granted to those who have taken law as a major subject; in short the work will be that of a regular University Department and not that of a professional school.

The ultimate aims of the department, when fully developed, will be (1) To furnish such instruction in the elementary principles of Anglo-American law as may properly form a part of the education of an American citizen; (2) To furnish such instruction in commercial law as may be adapted to the needs of those who intend to become merchants, bankers, brokers, etc., or to follow other lines of business; (3) To provide for students intending to enter the public service, adequate instruction in public and international law; (4) To furnish to students of political and social science, training in special branches of law related to such subjects; (5) To provide for the study of jurisprudence as a science and therewith of legal history and legal institutions; (6) To furnish to students intending to adopt law as a profession a complete and thorough course of instruction, which shall fit them for practice in any of the American States, or wherever the common law of England prevails.

The work, therefore, when fully developed, will include a wide range of studies. While it is yet too early to make a definite announcement of future courses, it may be said that instruction will be offered in the English substantive law, including the law of persons and of per-

sonal rights with the special limitations growing out of infancy, coverture, incorporation, etc. The law of property and of property rights, the law of commerce and of commercial and business relations, and the special jurisdiction of the courts of equity and admiralty; in the law of procedure and evidence in all the courts; in constitutional and international law; in legal history and institutions; in legal bibliography and legal material; in the civil law; and in general and comparative jurisprudence. Such courses will be added from year to year as the needs of the department and the number of instructors may warrant.

In addition to the courses which will form the undergraduate work of those electing law as a major subject, it is expected to provide fifth year or graduate courses especially adapted to the needs of those who intend to enter upon the practice of law as a profession, thereby enabling a student to complete in five years a thorough course in law in the same way in which he is now enabled to complete a course in any other specialty. Such courses when announced will be strictly graduate courses and will be open only to graduates of this University or other similar institutions.

It is not thought desirable that any student should devote all his time to the under graduate courses in law unless he is already a graduate of some college or university. Special students in law, other than graduates, will be received only upon the most rigid test as to their fitness to undertake the work, including *in all cases* a satisfactory examination in entrance subjects 1, 13, 14, and 15.

The courses announced for 1893–94 are intended mainly as the common groundwork of all the specialized courses which will be announced in succeeding years.

1. Elementary Law. This course deals with the structural elements of Anglo-American law and is intended to familiarize the student with its fundamental conceptions, principles, classifications, and relations. *Three hours a week, first semester.* Professor ABBOTT.

Course 1 is open to all students and is required of students in law.

2. Contracts. This course includes: (*a*) a study of the elementary principles and conceptions of the law of contracts; (*b*) a study of a considerable number of leading and typical cases from which the student will deduce statements of principles; (*c*) incidentally, instruction and practice in methods of dealing with legal material. *Two hours a week, through the year.* Professor ABBOTT.

Course 2 is open to all students and is required of students in law.

3. Torts. This course deals with the non-contract private law, that is, with the fundamental legal rights, other than those growing out of contract, the various wrongs by which such rights are invaded, together with the methods and limits of redress. Leading and typical cases will be studied in the same way and for the same purpose as in course 2. *Three hours a week, second semester.* Professor ABBOTT.

Open to all students and required of students in law.

4. Property. A comprehensive course on the law of personal and real property, with a study of the fundamental principles of possession and ownership. *Three hours a week, through the year.*

[Course 4 will not be given until 1894–95.]

5. Commercial Law. This course will include the main topics of the law merchant and special topics of importance in ordinary business transactions. *Two hours a week, through the year.*

[Course 5 will not be given until 1894–95.]

6. Constitutional Law. A study of the principles and judicial decisions of American constitutional law, including the preparation of reports and theses on special subjects. *Two hours a week, first semester.* Professor ABBOTT.

Students electing this course are especially urged to take as a preparation course 8, and, if possible, course 9, in History.

7. International Law and Diplomacy. An elementary course, intended to give a general view of the subject and to serve as a preparation for special courses to be announced hereafter. *One hour a week, second semester.* Professor ABBOTT.

8. Seminary in Politico-Legal Questions. The work in this course will consist in an investigation of some special constitutional, international, and legal questions that have an important bearing on political, social, or economic problems. The course is intended to be auxiliary to the courses in History and Political Science. *Two hours fortnightly, second semester.* Professor ABBOTT.

9. Constitutional and International Law. A course of lectures, beginning in October. Non-Resident Professor HARRISON.

MATHEMATICS.

Professors SWAIN and ALLARDICE, Associate Professor GREEN, and Instructors W. H. MILLER, J. A. MILLER, and COX.

The courses in mathematics at present begun are designed to meet the needs of three classes of students: 1. Those who wish to take one or more years of mathematics as a part of a liberal training. Courses 3 and 5 are designed to meet the needs of these students. 2. For those students who intend to pursue some branch of applied mathematics, as Engineering or Physics. The mathematics required of these students is indicated below. 3. For those who wish to pursue mathematics as a major subject. For these students courses 3 and 5 constitute the first two years' work. Third year students may take five or more hours from courses 6, 11, and 13. Fourth year students may take five or more hours from any of the third year courses (not previously taken) and from courses 12, 14, and 16.

1. Solid Geometry and Algebra. *a. Geometry.* Essentially as presented in the geometry of the solids and sphere in Byerly's Chauvenet. The Theory of Limits is especially emphasized. Students demonstrate fully the abridged demonstrations and all original exercises, and a few numerical exercises are introduced to illustrate the more general theorems (ten weeks). *b. Algebra.* After a general treatment of factorization and symmetry, quadratic equations are thoroughly reviewed, with the addition of new methods and theorems; powers and roots, indices, surds, imaginary and complex quantities, ratio, proportion and variation; progressions, and a brief treatment of permutations and combinations, a rigid proof of the binomial theorem for any index, convergence and divergence of series, partial fractions, indeterminate coefficients, and many additional theorems; an elementary though thorough treatment of determinants and the theory of equations (twenty-four weeks). In 1892–93 Charles Smith's Treatise was used as a text-book; in 1893–94 Hall & Knight's Algebra will probably be used. *Three hours a week, through the year.* Assistant Professor Hussey and Messrs. W. H. Miller and J. A. Miller.

Course 1 is open to students who have thoroughly mastered Plane Geometry, Factoring, and Quadratic Equations (Entrance Subjects 2-3 and 4), and is intended for students in Engineering and Physics.

2. Trigonometry and Plane Analytic Geometry. Lock's Trigonometry for Beginners. Particular attention is given to angular analysis and solution of trigonometric equations and its interpretation. The work in Analytic Geometry includes the completion of Briggs' Analytic Geometry and the first nine chapters in Charles Smith's Conic Sections. *Four hours a week, through the year.* Assistant Professor Hussey, and Messrs. W. H. Miller and J. A. Miller.

Open to students who are taking course 1, and intended for students in Engineering and Physics.

3. Solid Geometry, Algebra, and Trigonometry. The text-books used are the same as in courses 1 and 2. The solid geometry and trigonometry are substantially as in courses 1 and 2. In algebra Charles Smith's Treatise is followed more continuously than in course 1, it being designed that major students in mathematics shall again take up the subject of algebra

(Chrystal's text) in the third year. In 1893–94 an elementary treatment of modern Geometry will be included. *Five hours a week, through the year.* Mr. Cox.

Course 3 is open to students who have credit for entrance subjects 2–3 and 4. It is designed to meet the needs of students wishing to elect one or more years of mathematics, and at the same time is the first year's work for students making mathematics a major subject.

4. Modern Geometry. A systematic course of lectures on geometry, including a discussion of such questions as the theory of limits, transversals, inversion, contact problems, etc. Problems are assigned each week for solution by the students. [In 1893–94 course 4 will not be given as a distinct course, but will be mainly included in course 3]. *Two hours a week, through the year.* Professor ALLARDICE.

5. Plane Analytic Geometry and Calculus. An elementary course in Analytic Geometry and Calculus for those wishing to elect a second year in mathematics and for students making mathematics a major subject. Briggs' Analytic Geometry, with additional exercises; the theory in Osborne's Calculus, with a sufficient number of exercises to insure its mastery and facility in its application. *Five hours a week, through the year.* Professor SWAIN and Assistant Professor HUSSEY.

6. Advanced Algebra. In 1892–93 this course consisted of lectures on Chrystal's Algebra to the end of chapter XIII, with weekly exercises assigned to the students (first semester). In 1893–94 a course of lectures on the whole of the first volume and parts of the second will be given. *Two hours a week, through the year.* Professor ALLARDICE.

7. Plane and Solid Analytic Geometry. In Plane Analytic Geometry the first nine chapters of Charles Smith's Conic Sections and the first five chapters of his Solid Analytic Geometry. *Two hours a week, through the year.* Professor ALLARDICE and Messrs. J. A. MILLER and COX.

Open to students who have completed courses 1 and 2, or their equivalents, and intended for students in Engineering and Physics.

8. Differential and Integral Calculus. Taylor's Calculus supplemented with practical problems on special subjects.

Three hours a week, through the year. Messrs. J. A. Miller and Cox.

Open to students who have completed courses 1 and 2, and intended for students in Engineering and Physics.

9. Mechanics. Bowser's Analytic Mechanics; preceded by an elementary course in statics and dynamics treated geometrically. (Todhunter's Elementary Mechanics). *Three hours a week, through the year.* Mr. W. H. Miller.

Open to students who have completed courses 1 and 2, and to be taken with courses 7 and 8. It is intended for students in Engineering and Physics.

10. Mechanics. Bowser's Analytic Mechanics completed. *Three hours a week, first semester.* Mr. J. A. Miller.

Intended for students in Engineering and Physics.

11. Conic Sections. Smith's Conic Sections. In 1892-93 this course for the first semester was substantially the same as course 7. The second semester's work consisted of a general treatment of anharmonic ratios, involution, coaxial systems of circles, etc., with numerous examples; miscellaneous propositions, a chapter on systems of conics, and one on envelopes; a thorough treatment of trilinear coördinates, including areal and tangential coördinates; reciprocal polars, projections, and general applications of anharmonic ratios to conic sections. *Two hours a week, through the year.* Mr. W. H. Miller.

This assumes course 5 and may be taken as part of the third year in Mathematics, or by students in Engineering and Physics, wishing a fuller treatment than can be given in Mathematics 7.

12. Trilinear Coördinates. A course of lectures and recitations on Whitcomb's text. *Three hours a week, first semester.* Associate Professor Green.

13. Solid Analytic Geometry. A course of lectures and recitations on Salmon's text. *Three hours a week, second semester.* Associate Professor Green.

14. Calculus. Advanced course. Lectures on the Differential and Integral Calculus, with its application to the theory of plane curves, and on the lines of Williamson's Treatises. Exercises assigned each week. *Three hours a week, through the year.* Professor Allardice.

Open to students who have completed course 5, but students are advised to take course 14 after the completion of the third year work.

15. Analytic Mechanics. *Three hours a week, through the year.* Professor SWAIN.

This course is designed for students in Mathematics, and assumes course 5, but not necessarily any previous knowledge of Mechanics.

16. Advanced Statics. The first volume of Minchin's Statics is used as a text book. All the theory, illustrations, and the more difficult problems are discussed. *Two hours a week, through the year.* Professor SWAIN.

Students in general are advised to take course 15 in preparation for course 16. Graduate students in mathematics may, however, take course 16, omitting course 15.

[Course 16 will not be given in 1893–94.]

17. Advanced Dynamics. In 1893–94 course 17 will take the place of course 14, and is designed for the same grade of students. *Two hours a week, through the year.* Professor SWAIN.

18. Projective Geometry. Lectures. Cremona's Projective Geometry (English translation) is recommended as a text. *Two hours a week, first semester.* Professor ALLARDICE.

19. Determinants and the Theory of Equations. Lectures. Text-book recommended: Burnside and Panton's Theory of Equations. *Two hours a week, second semester.* Professor ALLARDICE.

20. Differential Equations. Text-book recommended: Forsyth's Differential Equations. *Three hours a week, through the year.* Professor ALLARDICE.

21. Modern Higher Algebra. Lectures. Determinants and the Theory of Equations, the Theory of Invariants, and Covariants of binary forms. *Three hours a week, through the year.*

[Course 21 will not be given in 1893–94.]

22. Methods of Least Squares. This course treats of the methods of combining the data resulting from exact measurements or observations in such a way as to diminish in

the greatest degree possible the effects of the errors of observation. It presupposes a knowledge of integral calculus. *Two hours a week, first semester.* Assistant Professor HUSSEY.

Open to students who have completed course 5.

23. Mathematical and Astronomical Club. Papers and talks by members of the club on the History of Mathematics and Astronomy and on problems in elementary subjects. Special effort is made to make the work of such a character that the membership need not be confined to advanced students in Mathematics.

ASTRONOMY.

Assistant Professor HUSSEY.

1. General Astronomy. *Three hours a week, through the year.* Assistant Professor HUSSEY.

This course is intended to furnish a general knowledge of astronomy, including a brief account of its history. For the most part it will be non-mathematical, although some knowledge of trigonometry is desirable.

2. Popular Astronomy. Lectures and recitations. *Two hours a week, second semester.* Assistant Professor HUSSEY. Open to all students.

3. Spherical Astronomy. *Two hours a week, second semester.* Assistant Professor HUSSEY.

This course includes the following subjects: Time, coördinates and their transformation, parallax, refraction, precession, nutation, aberration, reduction of star places, etc. It presupposes a knowledge of trigonometry.

4. Eclipses and Occultations. *Two hours a week, either semester.* Assistant Professor HUSSEY.

This course includes the theory of solar and lunar eclipses and occultations, their prediction and the phenomena attending them. It presupposes a knowledge of trigonometry, differential calculus, and spherical astronomy.

5. Orbits and Ephemerides. *Hours to be arranged, either semester.* Assistant Professor HUSSEY.

This course includes the more elementary parts of the theories of the motions of comets and planets, the determination of their

orbits, and the construction of ephemerides. It presupposes a knowledge of integral calculus.

GRADUATE COURSES AT THE LICK OBSERVATORY.

With the approval of President Kellogg of the University of California, Professor Holden, Director of the Lick Observatory, makes the following announcement: "The Lick Observatory of the University of California extends to the Leland Stanford Junior University the courtesy of receiving its graduates seeking one of the higher degrees, as A. M. or Ph. D., and also a limited number of special students."

The undergraduate courses in this University lead directly to such graduate work, and residence at the Lick Observatory will count as residence at the University. Students seeking such graduate courses should apply to Professor Hussey for further information.

PHYSICS.

Professors SANFORD and CARMAN, Instructors TAYLOR, STEARNS, and MURPHY, and Assistant CLEMANS.

1. Elementary Laboratory Physics, with especial reference to Chemical Physics. *Six hours a week, through the year.* Professor SANFORD and Mr. MURPHY.

In 1893–94 it is proposed to offer course 1 in connection with laboratory course *a* and lecture course 1 in Chemistry. Intended for first year students taking Physics or Chemistry as a major.

2. Elementary Laboratory Physics, with especial reference to Mechanics, Heat, and Electricity. *Nine hours a week, through the year.* Mechanics and Heat: Professor SANFORD and Messrs. MURPHY and CLEMANS. Electricity: Messrs. TAYLOR and STEARNS.

Open to students who have completed courses 1 and 2, or course 3, in Mathematics.

3. Elementary Laboratory Physics. *Fifteen hours a week, through the year.* Professor SANFORD and Mr. TAYLOR.

Open to students who have completed courses 1 and 2, or course 3, in Mathematics, and intended for students taking Physics as a major.

4. Electrical and Magnetic Measurements. Recitations and lectures *three hours*, laboratory practice *six hours a week, through the year.* Professor CARMAN.

This course is designed particularly for students in Applied Electricity. Open to students who have completed course 2, or course 3, in Physics.

5. Absolute Measurements in Electricity and Magnetism. Recitations and lectures *three hours*, laboratory practice *six hours a week, through the year.* Professor CARMAN.

Open to students who have had course 2 or course 3 in Physics.

6. Mathematical Theory of Electricity and Magnetism. The text-books of Maxwell and of Mascart and Joubert are used as the basis of the course. *Two hours a week, through the year.* Professor CARMAN.

[In 1893–94, course 7 will be substituted for course 6.]

7. Mathematical Physics. General Mechanics and Thermodynamics. Lectures and Recitations. *Two hours a week, through the year.* Professor CARMAN.

A course on the mechanical principles, laws of energy, theory of potential, fluid motions, wave motion, etc., applied to physical problems. A working knowledge of the calculus is necessary.

8. Sound and the Physical Theory of Music. Lectures. *One hour a week, second semester.* Professor SANFORD.

9. Theory of Periodic Electric Currents, Condensers, etc. Lectures and recitations. *Two hours a week, through the year.* Professor CARMAN.

The works of Fleming and Blakesley on alternating currents are used, with references to original papers of Hertz, Tesla, Lodge, etc. A working knowledge of differential and integral calculus, and a good experimental knowledge of electrical phenomena are necessary for the course.

[Course 9 was not given in 1892–93.]

10. Investigation of Original Problems in the Laboratory. Professors SANFORD and CARMAN.

ELECTRICITY AND MAGNETISM.

Students who desire to fit themselves for advanced investigations in electricity and magnetism, making their major in that line, are recommended to take the following courses: first year, Physics, course 1, Chemistry, lecture course 1, laboratory course *a*; second year, Physics, course 3. Courses 5, 6, 9, and 10, outlined above, are especially designed for the third and fourth years in this line. A course in chemical electricity will be offered if sufficient students should desire to pursue investigations in that line.

GRADUATE COURSES.

Graduate courses in Physics will be arranged after consultation by the faculty of the department. In general they will be laid out along two lines, Physical-Mathematical and Physical-Chemical. A knowledge of Mathematics through Analytical Geometry and Calculus will be required before entering either of the graduate courses in Physics, and a reading knowledge of French and German is much to be desired before undertaking any advanced work in Physics.

Three hours of laboratory work count as one hour of lecture or recitation.

Laboratory Fees.—A charge of from two to five dollars per semester, according to the time spent in laboratory practice, payable in advance at the Registrar's Office, will be made to cover the cost of material used in the laboratories.

CHEMISTRY.

Professor STILLMAN, Associate Professor RICHARDSON, and Assistant Professor LENOX.

I. LECTURE COURSES.

1. Elementary Inorganic Chemistry. Explaining and reviewing laboratory course *a*, and open, in connection with that course, to all students in the University. *One hour a week, through the year.* Associate Professor RICHARDSON.

2. Advanced Inorganic Chemistry. Experimental lectures and reviews. *Three hours a week, through the year.* Professor STILLMAN.

Open to all students who have completed laboratory course *a*, or its equivalent.

3. Organic Chemistry. Experimental lectures and reviews on the Chemistry of Carbon Compounds. *Two hours a week, through the year.* Associate Professor RICHARDSON.

Open to students who have completed course 2.

4. Industrial Chemistry. Lectures on the processes of Chemical arts and industries--fuels, acid and alkali manufacture, sugar making; petroleum; dyes, etc. *Two hours a week, through the year.* Professor STILLMAN.

Open to students who have completed courses 1 and 2, and laboratory course *c*; may be taken concurrently with course 3.

5. History of Chemistry. *One hour a week, second semester.* Associate Professor RICHARDSON.

6. Theories of Chemistry. Selected topics. *One hour a week, first semester.* Professor STILLMAN.

7. Urine Analysis and Toxicology. *Two hours a week, second semester,* in connection with laboratory courses *d* and *e*. Assistant Professor LENOX.

II. LABORATORY COURSES.

a. Experiments in Elementary Inorganic Chemistry, in connection with lecture course 1. *Two afternoons a week, through the year.* Associate Professor RICHARDSON, and Assistant Professor LENOX.

b. Qualitative Analysis. *Three afternoons a week, through one semester, one hour per week of which will be given to class-room work.* Assistant Professor LENOX.

Open to students who have completed course *a*.

c. Preparation of Typical Carbon Compounds. *Three afternoons a week, through one semester.* Associate Professor RICHARDSON.

Open to students who have completed course *b*.

d. Quantitative Analysis. *Four afternoons a week, through the year.* Professor STILLMAN, and Assistant Professor LENOX.

Open to students who have completed courses 2 and *b*.

e. Advanced Laboratory Work. Considerable option will be permitted during this year as to special lines of work to be pursued. Problems in Industrial Chemistry, Organic Chemistry, Water and Gas Analysis, Mineral Analysis, are among the special branches from which the advanced student may choose. *Four afternoons a week, through the year.* Professor STILLMAN and Associate Professor RICHARDSON.

Open to students who have completed course *d*.

Students in other major courses than chemistry, who may not be able to devote the full scheduled time to any of the above laboratory courses, may enter for a less number of hours, but will receive credit only on completion of the course.

III. CHEMICAL ENGINEERING.

In recognition of an increasing field of activity for men qualified to occupy positions as superintendents and managers of manufacturing enterprises involving chemical processes, it has been decided, in co-operation with the departments of Civil Engineering and Mechanical Engineering, to offer to students the opportunity to obtain such training as will best qualify them for such positions. Experience shows the great advantage in these positions of fundamental training in principles of con-

struction, strength of materials, steam engineering, machine designing, combined with thorough chemical training.

The degree of Chemical Engineer will be conferred, upon the completion of the above outlined course in chemistry and satisfactory courses in Mathematics, Applied Mechanics, Drawing, and Machine Designing.

It is estimated that students entering the University with that intention will be able to take the degree in one year after the baccalaureate degree. Students pursuing this course will be given the degree of A. B. in Chemistry at the end of four years.

IV. GRADUATE COURSES.

All possible encouragement and assistance will be given to graduate or special students who may desire to pursue advanced lines of special study or research.

Graduate students who are candidates for the degree of Ph. D. in Chemistry will be required to pursue a course of not less than three years' work subsequent to the reception of the baccalaureate degree. This course will include advanced work in the laboratory, and study of advanced courses in Chemical theories and history of Chemistry. An original investigation embodied in the form of a printed thesis, and satisfactory to the faculty, will also be necessary, together with such other requirements as the faculty may prescribe.

Laboratory Fees.—A charge of *fifteen dollars* per semester, payable in advance to the Registrar, will be made to students working two to three afternoons per week, and a charge of *twenty dollars* to those working four or more afternoons per week. Of these deposits *five dollars* is returnable at the close of the semester, less bills for breakage or loss of apparatus.

BOTANY.

GENERAL BOTANY.

Professor CAMPBELL, and Assistant SHAW.

1. Elementary Botany. Study of types of the principal groups of plants, with lectures upon special morphology and classification. (Campbell's Elements of Structural and Systematic Botany). *Three times a week, through the year.* Given conjointly by Professors CAMPBELL and DUDLEY.

The aim of this course is to give the student a grounding in the principles of plant structure and classification, derived from a careful study in the laboratory of selected types, supplemented by such explanatory lectures as may be deemed necessary.

2. Algae and Archegoniata. Lectures, reading, and laboratory work. *Three times a week, through the year.* Professor CAMPBELL and Mr. SHAW.

3. Histological Methods. *Two times a week, through the year.* Professor CAMPBELL.

4. Experimental Physiology. *Five times a week, second semester.* Professor CAMPBELL.

5. Advanced Work, intended especially for graduate students. Professor CAMPBELL.

Course 1 must precede all other courses, and students making the subject a major must complete courses 1 to 4 inclusive, and also courses 2 and 3 in Systematic Botany before graduation. Course 5 is intended especially for graduate students, and opportunities will be given such students for carrying on special lines of work upon original problems.

Laboratory Fees.—Three dollars per semester for each course.

SYSTEMATIC BOTANY.

Professor DUDLEY.

Instruction in this department chiefly relates to the Spermaphytes, their structure, affinities, and geographic distribution. The advanced work on the Fungi will also be given under its direction.

1. Elementary Botany. A study of types of the principal groups of plants: laboratory work and lectures. *Three hours a week, through the year.* Given conjointly by Professors DUDLEY and CAMPBELL.

The work on the Spermaphytes occurs in the latter half of the second semester.

Course 1, or its equivalent, is required of all students electing Systematic Botany as a major.

2. The Fungi. *Five hours a week, first semester.* Professor DUDLEY.

The laboratory work (three hours) will be devoted chiefly to morphology and development; the lectures to the systematic and economic relationships of the various groups.

3. The Spermaphyta. *Five hours a week, second semester.* Professor DUDLEY.

The morphology, histology, and affinities of the principal orders of flowering plants represented on the Pacific slope will be studied and the student made acquainted with as many forms as practicable, through field and laboratory work.

4. The Algae and Archegoniata. [See course 2 under General Botany.]

5. Advanced Work and special investigations in the biology and classification of the Spermaphyta. *Five hours a week, through the year.* Professor DUDLEY.

A course will be given after 1893—94 on forest trees and forest distribution, including the general principles of Geographic Botany.

Laboratory Fees.—Three dollars per semester for each course.

ENTOMOLOGY.

Professor COMSTOCK, and Assistant Professor KELLOGG.

The instruction in this department is given by means of lectures, laboratory practice, and field work. In the lectures the more general questions are discussed, with the view of giving the students as broad a knowledge of

the subject as is practicable in the time devoted to it. In the laboratory work especial attention is paid to the methods of investigation and to training in accurate observation.

1. General Lecture Course. Lectures treating of the zoological position of insects; the characteristics of the orders, sub-orders, and of the more important families; the habits of insects with special reference to those species that are of economic importance; and the practical application of entomology, including discussions of insecticides, and of the various methods of controlling the ravages of insects injurious to agriculture. *Three lectures a week, during January, February, and March.* Professor COMSTOCK.

2. Introductory Laboratory Course. Laboratory and field work, including the study of the more general features of insect anatomy, the determination of genera and species, and practice in collecting and preserving specimens. *From five to twelve and a half hours a week, through the year.* Professor COMSTOCK and Assistant Professor KELLOGG.

Open to students who have completed course 1 in general zoology, or its equivalent.

3. Advanced Laboratory Course. Special work in morphology, or classification, or in working out the life-history of insects. *From five to twelve and a half hours a week, through the year.* Professor COMSTOCK and Assistant Professor KELLOGG.

Open to students who have completed course 2.

4. Morphology and Classification of the Coccidæ (Scale insects.) *Seven and a half hours a week, during January, February, and March.* Professor COMSTOCK.

Open only to students who have completed one semester of course 2.

5. Public Lectures. A course treating of the more important insects of the orchards of California. This course is given in connection with a public course on Horticulture, and other lectures of general interest. All persons interested are invited to attend these lectures. *Daily, for one week during February.* Professor COMSTOCK.

HORTICULTURE.

Assistant Professor E. E. Smith.

Ten acres of the experimental and illustrative grounds are now under cultivation, and a commodious building for the storing of tools, seeds, etc., is being erected. The collecting of material of various kinds is in progress, and additional grounds will be occupied and buildings constructed as rapidly as the necessity demands. Conservatories will be erected, fruit trees planted, and the most approved modern methods of conducting orchards, vegetable gardens, floral establishments, etc., will be shown in a practical manner. In addition to lectures and laboratory work, students will be required to perform a certain amount of labor in the field. Arrangements have been effected whereby students may, during the course, have the advantage of a brief season of practical work in near by orchards, nurseries, canneries, floral and seed establishments, etc.

A horticultural museum is in process of formation, a large number of specimens having already arrived.

A special course of popular lectures will be delivered at a seasonable time each year, which all interested are invited to attend.

1. Applied Horticulture. *a.* Definitions of horticultural terms, origin, formation, classification, and cultivation of soils, composition of plants and plant foods, fertilizers, irrigation and drainage, relations of employers and laborers, keeping of records and accounts, weeds, etc. *b.* History of economic plants, development of horticulture, originating of new varieties, variation in cultivated plants, climatic influences and effect of different soils and elevations upon plants, fruits, vegetables, etc. Lectures *three hours a week*, field and laboratory work *two hours a week, through the year.* Assistant Professor E. E. Smith.

2. Nursery and Fruit Culture. *a.* Nursery: germination of seeds, propagation by cuttings, etc., grafting, budding,

disbudding, planting, cultivating, digging, packing nursery trees, etc. *b.* Fruit Culture: selecting location for orchards and vineyards, identifying varieties of fruits, planting trees and vines, orchard pruning, grafting, and culture, thinning fruit, picking, packing, marketing, etc. Lectures *three hours a week*, field and laboratory work *two hours a week, through the year.* Assistant Professor E. E. Smith.

3. Preserving Fruit. Canning, drying, preserving, picking and sugaring fruits, making of jellies, jams, Olive Oil, etc.

4. Floriculture. Greenhouse structures, systems of heating, commercial plant culture, cut flower growing, culture of bulbs, tropical and semi-tropical plants, etc.

5. Vegetable Gardening. Varieties of vegetables, sowing of seeds, culture, preparation for market, forcing and forcing structures.

6. Seed Growing. Field practice, growing and harvesting, handling retail and wholesale, etc.

7. Landscape Gardening. Landscape plans, roads and sidewalks, grading of land, ornamental trees, shrubs, plants, flower-beds, grouping of trees and shrubs, shade trees, combination of colors and forms, architecture and landscape, etc.

8. Horticultural Literature; Horticulture in foreign countries, etc.

[Courses 3 to 8 inclusive will not be given in 1893–94.]

Collateral Studies.—Elementary and economic botany, vegetable physiology, fungi, etc.; general and horticultural chemistry, analysis of fertilizers, soils, plants, fruits, water, etc.; elementary and economic entomology, structure and life of insects, etc.; general zoology, rabbits, squirrels, gophers, field mice, toads, etc.; fruit and insect eating birds; elementary geology; elementary mechanics; drawing, geometrical, flat and perspective; surveying; grading, draining and ditching land, etc.

PHYSICAL TRAINING AND HYGIENE.

Professor Wood, and Instructors Lowell and Black.

For the physical training of students there are two buildings, Roble Gymnasium, for young women, and

Encina Gymnasium, for young men. Both are temporary frame buildings, but are substantially built, and are well equipped with the apparatus and appliances intended for the development and training of students.

Excellent facilities for athletics have been provided. The young women have two tennis courts, paved with bituminous rock; the young men proportioned to their greater numbers, have four courts of the same material. The athletic field of thirteen and a half acres contains, in addition to the tennis courts, a quarter-mile running track, with space inside for base-ball and field sports. This is graded, drained, and covered with cinders, clay, or sand, as the use of each area demands. Beyond the oval is the grass foot-ball field. Practice fields for base-ball and foot-ball are located upon adjoining grounds. A lake, half a mile long, near the University buildings, furnishes opportunities for rowing. A boating club has been organized and a boat-house has been built.

All the work in physical training is under the supervision of the medical director, who is the professor of hygiene and physical training. All students are entitled to medical advice and treatment, except in case of protracted illness or contagious disease.

The physical measurements of the students are taken at intervals throughout the course. The information given by the physical measurements and the medical examination, including an examination of the eyes and other special sense organs, furnishes to the medical director the basis of advice to individual students as to the hygienic regimen most conducive to health and systematic development. Exercises are prescribed for the indivdual directed first to the correction of physical deformities and errors in health, and then to the complete development of the student. The gymnastic work is under the con-

stant supervision of the professor of physical training and the instructors in this department.

1. Gymnastic Exercises. Individual and class work, with and without apparatus. *Three hours a week, through the year.* Professor Wood, Miss Lowell, and Mr. Black.

Open to all students, under the advice of the medical director. One hour of credit will be given for systematic prescribed work in physical exercise, the three exercises a week to be taken on separate days arranged according to the work of the student.

2. Personal Hygiene. *Two hours a week, through each semester.* Complete course each semester. Professor Wood.

Open to all students. Course 2 is designed to give the student practical knowledge upon matters pertaining to the care of the health, and treatment in emergencies, or "First Aid to the Injured."

3. Advanced Hygiene. *Two hours a week, second semester.* Professor Wood.

Open to students who have completed course 2. Course 3 will take up the study of general hygiene and sanitary science. Students will prepare papers upon assigned topics.

4. School Hygiene. *Two hours a week, first semester.* Professor Wood.

Open only to students in the Department of Education and others who expect to teach. The subjects studied will include: physiology and hygiene of the nervous system; personal hygiene of school children; location, architecture, and surroundings of schoolhouses, lighting, heating, ventilation, and furniture of schoolrooms; hygiene of instruction; school diseases; physical training in schools, and the examinations and measurements of children.

The following courses, in addition to courses 2, 3, and 4 are designed for candidates for the degree of A. B. in Physical Training and Hygiene, and for special students in this department.

[**5. General Anatomy and Physiology.** See course 1 in Physiology.]

[**6. Animal Physiology.** See course 2 in Physiology.]

7. Applied Anatomy and Physiology. *Two hours a week, through the year.* Professor WOOD.

Course 7 takes up the study of human anatomy and physiology from the standpoint of physical training.

8. Physical Education. *Two hours a week, second semester.* Professor WOOD.

Course 8 includes the special physiology of exercise and bodily mechanics, history of physical training, and the study of the various "systems of physical culture."

9. Physical Training. *Six hours of exercise a week, through the year.* Professor WOOD, Miss LOWELL, and Mr. BLACK.

Course 9 includes individual and class exercises; use of developing and other apparatus; calisthenics; light and heavy gymnastics; health and medical gymnastics, with and without apparatus; gymnastic and athletic games.

10. Special Courses of instruction and training are laid out for advanced and special students according to the needs and qualifications of each individual. Such courses include instruction and practical work in anthropometry, charting and tabulation of statistics, physical examinations, diagnosis, special tests, prescription of exercise, medical gymnastics, fitting of gymnasiums etc. Special investigations in the laboratory and gymnasium are taken up by advanced students as rapidly as they are able to do such work. This work includes investigations into the physiology of special exercises, testing of physical conditions and specific effects of various exercises upon the nervous system, heart, and lungs, and the various bodily functions. Professor WOOD.

PHYSIOLOGY AND HISTOLOGY.

Professor JENKINS, Instructor MCFARLAND, and Assistant GREENE.

UNDERGRADUATE COURSES.

1. General Anatomy and Physiology. Lectures *two hours a week*, laboratory work *seven and a half hours a week, through the year.* Professor JENKINS, and Messrs. MCFARLAND and GREENE.

The course is intended to lay a scientific foundation for more advanced courses in Animal Physiology and Histology: First, by the study of the cell and its activities as shown in the unicellular organisms, in reproductive cells, and in individual cells of many tissues; secondly, by the study of the laws and course of development, resulting in higher differentiations in structure, and specializations in function exhibited in a selected series of organisms, both animals and plants, of increasing complexity; thirdly, by the comparative study of the physiological processes of forms placed under widely different conditions. The laboratory work of the course will give occasion to discuss many questions of General Biology.

2. Animal Physiology. Lectures *one hour a week*, laboratory work *five hours a week, through the year*. Professor JENKINS and MR. GREENE.

This course is to be preceded by course 1. It includes an experimental course in Physiology based upon Foster's Physiology as the text.

3. Histology. Laboratory work *five hours a week, through the year*, with occasional lectures. MR. MCFARLAND.

The course includes both the study of the tissues in a comparative way, and the history of their development. Open to those who have taken course 1, or its equivalent. Students with Physiology as their major are advised to take courses 2 and 3 together.

[**4. Vertebrate Embryology.** See course 4 in the Department of Zoology.]

5. Special Courses in Histology. Professor JENKINS and MR. MCFARLAND.

These courses are open to those who have taken courses 1 and 3. Under this head a special course in Histology, Histogenesis, or in Cell Morphology, will be planned for each individual student, with the end in view of giving opportunity for a more extended study of some phase of one of these subjects, and a careful drill in the methods of Histology. The time for each course will be fixed to accord with the nature of the work.

6. Special Courses in Physiology. Professor JENKINS and MR. GREENE.

These courses are open to those who have taken courses 1, 2, and 3. These courses will be a continuation of course 2, but

along lines of more advanced study of special subjects. A special course will be arranged for each individual student. The time of each course will vary according to the exigencies of the case.

7. Structure and Functions of the Nervous System and the Sense Organs. Lectures *one hour a week*, laboratory *five hours a week, second semester*. Professor JENKINS and MR. MCFARLAND.

It is desirable that students in this course should have had at least the biological training represented by course 1.

8. Teachers' Course in General Physiology. Laboratory work *five hours a week, first semester*, with occasional lectures. Professor JENKINS.

The course is arranged to give a practical illustration of the methods of the study and teaching of Physiology in the elementary schools. Students who expect to teach are received into this course on the recommendation of the Department of Education.

9. Journal Club. Students in the advanced classes will be expected to meet once a week to discuss current literature in Physiology and Histology.

10. Seminary in Physiology and Histology. *Two hours a week, through the year.* Professor JENKINS.

Open to graduate students.

Candidates for Bachelor's Degree who select Physiology and Histology as a major will be expected to take courses 1, 2, 3, 4, and 9, and at least two semester's work of five hours each to be made up from courses 5, 6, and 7; and in addition courses 1 and *a* in Chemistry.

In this department two and a half hours of laboratory work count as one lecture hour.

Laboratory Fees—Five dollars per semester for each course, except courses 9 and 10.

GRADUATE COURSES.

The graduate courses in Physiology and Histology will be planned in the case of each individual student. They will include the thorough study of some of the more re-

cent special treatises of various subjects in Histology and Physiology, and a repetition of a sufficient number of experimental investigations to give a discipline in the methods of investigation. There will be given at different times a series of advanced lectures on Physiological and Histological subjects. The graduate students will meet weekly to discuss the journals of the Department, and will participate in the work of the Seminary in Physiology and Histology. Students in this department will occupy the latter portion of their course mainly on some original research, the subject of which is determined by their previous training and their inclinations. The collateral subjects to be pursued with the major will be chosen for each candidate with reference to his particular needs.

PREPARATORY MEDICAL COURSE.

Students intending to enter on the study of medicine, are advised to take Physiology and Histology as a major subject, with Chemistry, Physics, Comparative Anatomy of the Vertebrates, and Hygiene among the collateral subjects. Such a course gives that foundation both in scientific knowledge and in skill in experimental Physiology, and in Histological and Anatomical technique, which will make it possible to accomplish the medical course of the best medical schools in a much shorter time and with much greater advantage.

ZOOLOGY.

Professor GILBERT, and Instructors PRICE and THOBURN.

1. General Zoology. A laboratory course, involving the study of representatives of the principal groups of animals, together with lectures on their structure and classification, and on the general laws of biology which they illustrate. *Two lectures*

and three laboratory afternoons a week, through the year. Professor GILBERT and MR. PRICE.

2. Comparative Anatomy of the Vertebrates. A more detailed examination of vertebrate morphology, including dissection of representatives of the several classes of vertebrates, with comparative studies in vertebrate osteology, the nervous and circulatory systems, etc. *Three afternoons a week, through the year.* Professor GILBERT and MR. THOBURN.

[**3. Normal Histology.** *Two afternoons a week, first semester.* See course 3 in Physiology.]

4. Vertebrate Embryology. Studies in the development of the chick and the salamander. Laboratory work and lectures, *two afternoons a week, second semester.* MR. PRICE.

5. Ichthyology. A course of lectures and laboratory work, including an examination of the larger groups of fishes, with special reference to the characters on which they are based, and including practical work in the discrimination of species. *Two afternoons a week, through the year.* Professor GILBERT.

6. Advanced Ichthyology. Special problems in the morphology and classification of fishes will be set for advanced students prepared for such work. *Five times a week, through the year.* Professor GILBERT.

Course 1, or its equivalent, must precede all others, and courses 1 to 6, or their equivalents, will be completed before graduation by all regular students making Zoology their major study.

Work for graduate and special students will be laid out in accordance with their individual needs and preferences.

Laboratory Fees.—Five dollars per semester for each course.

THE ZOOLOGICAL MUSEUM.

The zoological museum contains a very full representation of the fishes of North America, consisting of about 5,000 alcoholic specimens representing about 1,500 species. These include among others a valuable series of the deep-water fishes of the Pacific, and large collections from the West Indies and the Sandwich Islands. During the past year large additions have been made to the col-

lections of birds and mammals, these now numbering about 1,900 bird skins and 250 mammals.

Material illustrating the principal groups of invertebrates is ample for class instruction.

GEOLOGY.

Professor BRANNER, and Assistant Professor J. P. SMITH.

1. Dynamic and Structural Geology. Geikie's Class-book of Geology. (*a*) Lectures *three hours a week*, (*b*) field and laboratory work *six hours a week*, *first semester*. Professor BRANNER.

2. Economic Geology. Lectures. *Two hours a week*, *second semester*, with visits to mines. Professor BRANNER.

Open to students who have completed course 1.

3. Topographic Geology. Field and laboratory work, with the construction of geologic maps, models, and sections. *Fifteen hours a week*, *through the year*. Professor BRANNER.

Open to students who have completed course 1.

4. Special Courses of instruction and training are laid out for advanced and special students according to the needs and qualifications of each individual. Special investigations are taken up by advanced students as rapidly as it is possible for them to undertake such work advantageously. Professor BRANNER.

5. Mineralogy. *a*. Blowpipe analysis (first semester). *b*. Elementary crystallography and physical mineralogy (second semester). *Four hours a week* laboratory work, *through the year*. Assistant Professor J. P. SMITH.

6. Advanced Mineralogy and Petrography. *a*. Mathematical, Physical, and Chemical Crystallography (first semester). *b*. Descriptive Mineralogy and Petrography, with special studies of the rock-forming minerals (second semester). Lectures *two hours a week*, laboratory work *six hours a week*, conferences *weekly*, *through the year*. Assistant Professor J. P. SMITH.

Open to advanced students and graduates.

7. Paleontology. *a.* Systematic Paleontology, or the history and character of organisms (first semester). *b.* Historical Geology, or the history and character of formations (second semester). Lectures *two hours a week*, laboratory *four hours a week*, conferences *weekly*, *through the year*. Assistant Professor J. P. Smith.

Open to students who have completed course 1.

8. Paleontology. Original investigation of various problems in Paleontology, especially of the distribution of faunas. This course will consist entirely of private work, in field and laboratory. Assistant Professor J. P. Smith.

Open to advanced students and graduates.

Three hours of laboratory or field work are equivalent to one hour of lecture or recitation work.

Laboratory Fees.—Three dollars a semester in course 5.

MINING ENGINEERING.

The instruction in Mining Engineering will include the following courses in other departments : Mathematics 1, 2, 7, 8, and 9; Civil Engineering 1, 2, 3, 5, and 8 ; Drawing 1 ; Chemistry 1 and 2, and *a*, *b*, and *d* ; Geology 1, 2, 4, 5, 7 ; Physics, 2 ; Electrical Engineering. Students who intend to make Mining Engineering a major are advised to offer French and German as entrance subjects.

1. Mining Machinery and Mill Work. *Three hours a week, second semester.*

Course 1 assumes Mathematics 7, 8, and 9, Civil Engineering 1 and 5, Drawing 1, Chemistry 1, *a*, and *b*, and Geology 1 and 5.

2. Assaying. *Three hours a week, second semester.*

Course 2 assumes course 1, course 2 in Physics, courses 2, 3, and 8 in Civil Engineering, course 2 in Chemistry, and course 7 in Geology.

3. Metallurgy. *Three hours a week, through the year.*

Course 3 assumes the same preparation as course 2.

4. Ore Dressing, etc. *Two hours a week, first semester.*
Course 4 assumes the same preparation as course 2.

5. Mining. *Two hours a week, through the year.*
Course 5 assumes the same preparation as course 2.

DRAWING AND PAINTING.

Assistant Professor BROWN, and Instructors AMES and A. B. CLARK.

The instruction in this department is given with a view to its educational value. The aim is to give power to observe visible facts, skill to record them, intelligence to understand them, and esthetic sensibility to feel their significance and beauty. Different materials, as pencil, pen, sepia, etc., are used at different times because each gives a peculiar kind of mental and manual discipline, and helps the student to find that material which most naturally lends itself to the expression of those qualities in nature that particularly appeal to him.

The student begins with the study of the laws of perspective, of light and shade, and of color, in their practical application—which, being a science, can be taught, and afterwards considers the fine art of representation, which, being art, can be "learned, but not taught." Still, so far as is possible, by the study of examples and of nature, and the general cultivation of the esthetic and creative faculties, art is taught. It is assumed that sensibility and knowledge and skill underlie the only valuable esthetic judgments and tastes whether regarding things of nature or of art. Gradually, and more and more as the work advances, esthetic questions are considered and work is criticised from that side. As an aid to this, some attention is given to the literature of the subject, and, as soon as examples are procured, will be given to the study of drawings by various masters in various

materials; and it is hoped, in the near future, to offer courses in Art History.

Considerable freedom is allowed the student as to the subjects he will study and the materials he will use. It is not intended to give him a bias towards any particular technical style, the only technical requirement being that the work shall be done on the fundamental principles of all sound workmanship. For sufficiently advanced students cast and life work is provided. Landscape work is given as much attention as figure work. The training is such that scientific students can easily work into scientific illustrating, and whatever assistance in this line is practicable will be given.

In some of the courses there is indicated more work, or a greater variety, than can be taken by any one student in the time allotted: the student is to choose which he will take. So far as possible each student is treated separately, and is given the practice he most needs.

Three hours of drawing are equivalent to one hour of lecture or recitation work.

1. Elementary. *a.* Methods of observation, and their application to elementary flat copying with the lead pencil, of lines, squares, circles, mathematical curves, and simple outlines of natural forms. *b.* Outlining the geometrical model. *c.* Shading the geometrical model. *d.* Outlining and shading other simple objects. Memory and time sketches required from time to time throughout. *Six hours a week, first semester.* Assistant Professor Brown, Miss Ames, and Mr. A. B. Clark.

Open to all students, but arranged especially for students in Mechanical and Civil Engineering.

[Course 1 is not a preparation for course 2, second semester.]

2. Elementary Drawing, Light and Shade, Still-life, and Landscape. *a.* An analysis of methods of observation, with application to elementary flat copying with the lead pencil, of lines, squares, circles, mathematical curves, and simple outlines of natural forms. *b.* Outlining the geometrical

model. *c.* Scientific perspective. *d.* Shading exercise, with pencil, pen, or wash. *e.* Shading geometrical model. *f.* Graded exercise in still life drawing in light and shade, in wash, pen, pencil, or charcoal, with special attention given to correct interpretations of values of local colors. *g.* Studies in line and wash. *h.* Drawing from nature—out doors. Study of the literature of drawing. *i.* Drawing from the cast in charcoal. Time and memory sketches. (Reference books: Hamerton's Graphic Arts, Ruskin's Elements of Drawing, Modern Painters, and Laws of Fesole, Allongé's Charcoal Drawing, and Tyrwhitt's Pictorial Art.) *Nine hours a week, through the year.* Assistant Professor BROWN, Miss AMES, and Mr. A. B. CLARK.

Open to all students.

3. Landscape, Casts, Still-Life, and Life Work. *a.* Drawing from nature—landscape. *b.* Still-life. *c.* Casts. *d.* Time and memory drawings. *e.* Elementary Study of oil painting. *f.* Drawing from life (portraits and costume), or from nature (landscape.) Oil painting in still life may be taken up if the student's power of drawing warrants it. *Twelve hours a week, through the year.* Assistant Professor BROWN and Miss AMES.

Open to those who have had course 2, or its equivalent.

4. Scientific Perspective. *a.* Theory of perspective and applications in assumed problems: with instruments. *b.* Use of principles of perspective in actual problems: from nature. *c.* Perspective criticism and study of drawings and photographs. *Six hours a week, second semester.* Mr. A. B. CLARK.

5. Artistic Anatomy. *a.* The study of the skeleton and the mechanism of the articulations as related to movements and attitudes. *b.* The Muscles: muscular contraction and the changes of form which result therefrom. *c.* Analysis of expression of passions and emotions, and the study of the special movements of the facial muscles. *Two hours a week, second semester.* Miss AMES.

6. Lectures on Art. *a.* Analysis of some of the elements of visible beauty. *b.* Practical exercises: drawing from natural objects, with written analyses, from the esthetic standpoint; laboratory work in esthetics, outdoor work, study of pictures. *Two hours a week, second semester.* Assistant Professor BROWN.

Open to students who have had course 2.

7. Architectural Draughting. *a.* Lectures on the elementary principles of Architecture. *b.* House planning and wood construction. *c.* Study of masonry in modern American architecture. *d.* Design in masonry. *Nine hours a week, through the year.* Mr. A. B. Clark.

8. Portraits, Casts, and Still Life, in Color. *Nine hours a week, through the year.* Assistant Professor Brown, and Miss Ames.

It is intended to arrange further courses in color, in figure work, and in landscape, as the needs of the students demand.

CIVIL ENGINEERING.

Professors Marx, Wing, and Hoskins, and Assistant Adams.

I. GENERAL WORK.

Linear Drawing and Descriptive Geometry.

1. *a.* **Linear Drawing and Lettering.** *Six hours a week, first half of first semester.* *b.* **Descriptive Geometry,** including its application to shades, shadows, and perspective. Lectures and recitations *two hours a week,* drafting *six hours a week, second half of first semester,* and *second semester.*

Course 1 *a* is open to all students, and is required of students in Engineering; 1 *b* is open to students who have completed solid Geometry and 1 *a*, and is required of students in Engineering.

Applied Mechanics.

2. a. Graphic Statics. This course begins with a discussion of the general theory of complanar forces applied to a rigid body. The principles relating to the composition, resolution, and equilibrium of forces are deduced graphically, and graphic methods are given for the solution of statical problems. Then follow applications to the determination of stresses in simple framed structures, including trusses sustaining both fixed and moving loads. The determination of centroids and moments of inertia of plane areas is then taken up, but this subject is treated only so far as it has useful applications in the solution of problems in the design of structures. Lectures and recitations

three hours a week, drafting *six hours a week, first ten weeks of first semester*. Professor HOSKINS.

b. Mechanics of Materials. Under this head are treated the strength and elastic properties of the ordinary materials of engineering. The main subjects covered are simple tension, compression, and shear; theory of flexure, with applications to simple and continuous beams; theory of long columns; torsion and shafts; repeated stress; sudden stress and resilience. Lectures and recitations *five hours a week for twelve weeks*, following course 2 *a*. Professor HOSKINS.

c. Hydrostatics and Hydraulics. This course treats of fluid pressure, the principles of fluid equilibrium, and the laws governing the flow of water through orifices, over weirs, in closed conduits, and in open channels. Lectures and recitations *five hours a week for twelve weeks*, following course 2 *b*. Professor HOSKINS.

Open to students who have completed courses 1, 2, 7, 8, and 9, and have taken or are taking course 10 in Mathematics; required of all students in Civil Engineering.

3. Testing of Materials. In this course each student is required to make a series of experiments, testing the strength and elastic properties of wrought iron, cast iron, steel, timber, brick, stone, and cement. A careful record of all experiments is required of every student. Laboratory work *six hours a week, second semester*. Professor HOSKINS.

Open to all students who have taken, or are taking, course 2 *b*. Required of all students in Civil Engineering.

II. SPECIAL WORK.

Topographical and Geodetic Engineering.

4. Elementary Surveying. This course treats of surveying instruments and their adjustment, followed by the study of the various methods of surveying, and their application in actual field work. The drafting of the course includes topographical mapping and sketching. Lectures and recitations *two hours a week*, drafting and field work *nine hours a week, first semester*. Professor MARX.

Open to students who have completed courses 1 and 2 in Mathematics and 1 *a* in Civil Engineering; required of all students in Civil Engineering.

5. Geodesy. The treatment of this subject will include methods of base line and angle measurements, the adjustment of observations, geodetic levelling, and map projections. Lectures and recitations *two hours a week*, drafting and field work *nine hours a week, first semester.*

Open to students who have completed courses 1, 2, 7, 8, 9, and 10 in Mathematics, and courses 1 *a*, 1 *b*, and 4 in Civil Engineering; required of students who have their major in Geodetic Engineering.

[Course 5 will not be given in 1893–94.]

Railroad Engineering.

6. Economic Theory of Railroad Location, including Railroad Surveying, Location, and Construction. Lectures and recitations *two hours a week*, drafting and field work *nine hours a week, second semester.* Professor MARX.

Open to students who have completed course 4 in Civil Engineering; required of all students in Civil Engineering.

7. Railroad Operation and Management. Lectures and recitations. *Three hours a week, first semester.*

[Course 7 will not be given in 1893–94.]

It is the intention to offer ultimately a special course in Railroad Engineering in connection with the department of Economics. The collection of railroad books in the Hopkins Library offers exceptional opportunities for research in this line.

Bridge Engineering.

8. Elementary Designing of Structural Details. Lectures, recitations, and reports on assigned topics, *two hours a week*, designs and estimates (drafting), *nine hours a week, through the year.* Professor WING.

Open to students who have completed courses 1 *a* and *b*, and who have completed or are taking course 2; required of students in Civil Engineering.

The course is general and elementary in character, dealing with principles rather than with concrete examples. An effort is made to give the student a thorough groundwork for designing accord-

ing to present practice, and at the same time to call attention to the lines along which future progress in designing may be expected to take place. The problems are chosen to emphasize as many of the points that arise in designing details as possible. The subjects considered are as follows:

a. Wood—Combination Structures. 1. Wood as a constructive material. 2. Design of joint details, design of simple structures, with preparation of working drawings and bills of materials.

b. Iron—Riveted Structures. 1. Metallurgy of iron and steel. Interpretation of steam diagrams. Stresses in cranes; plate girders, and other mill details. 2. Design of riveted joint details. Design of mill building, with working drawings and bill of material of some portion of the structure.

c. Iron—Pinconnected Structures. 1. Highway bridges. Theory and calculations for the various kinds of trusses. 2. Design of pinconnected joint details. Design of highway bridge, with detail drawings.

d. Masonry—Arches. 1. Theory of masonry arches. Lectures on engineering architecture. Methods of using and testing masonry materials. 2. Stereotomy. Design of architectural details suitable for engineering structures. Design of masonry arch bridge.

9. Railway Bridges. Lectures, recitations, and reports, *two hours a week*, designs and estimates (drafting), *nine hours a week, through the year.* Professor Wing.

Open to students who have completed course 8. The stresses in as many actual structures of the modern types of bridges as possible are determined, comparing the theory and practice. One or more designs are made by each student to fulfill actual conditions, the parts proportioned, and true bills of material prepared as a basis for estimating the cost. Special attention is given to the study of details, shop methods, and economy in manufacture. The work in designing is largely devoted to finding out, when possible, the principles underlying present practice instead of designing according to arbitrary specifications. No text book will be adopted, but constant use will be made of a complete reference library.

The subjects considered and their order is as follows: *a.* Location. Economic length of span, subaqueous foundations, piers and abutments. *b.* Design. Kinds of trusses, loads, stresses,

details, quality of material required. *c.* Manufacture. Shop methods and machinery, inspection, testing material. *d.* Erection. False works, erecting machinery.

10. Non-Simple Structures. Class room, *two hours a week*, drafting room, *nine hours a week, first semester.* Professor WING.

In this course will be treated such structures as swing and suspension bridges, continuous trusses, elastic arches, and building skeletons.

[Course 10 will not be given in 1893–94.]

11. Seminary. The student will be assigned some subject in the line of bridge engineering for special investigation and discussion, and involving the preparation of a thesis. *Five hours a week, second semester.* Professor WING.

[Course 11 will not be given in 1893–94.]

Hydraulic Engineering.

12. Water Supply Engineering for Towns and Districts. Sources of supply. Collecting and storing of water either for water supply of towns or for irrigation purposes. Settling, filtering, conducting, and delivering of water, including the study and design of all accessory works. Lectures and recitations *three hours a week*, drafting *nine hours a week, first semester.* Professor MARX.

Open to students who have completed courses 2 *a* and *b*, 3, 4, and 8; required of all students who take their major in Hydraulic Engineering.

13. Sanitary Engineering, including sewerage of towns and drainage of lands. Special attention will be given to the study of all municipal sanitary problems, such as removal of sewerage, destruction of garbage, construction, maintenance, sweeping, and repairs of streets and pavements. Lectures and recitations *three hours a week*, drafting *six hours a week, second semester.* Professor MARX.

Open to students who have completed courses 2, *a* and *b*, 3, 4, 8 and 12; required of all students who take their major in Hydraulic Engineering.

III. FIFTH YEAR COURSES.

No fifth year courses in Civil Engineering will be given before 1894–95.

MECHANICAL ENGINEERING.

Professor A. W. Smith, Assistant Professor Bryant, and Assistants Buchanan and Herby.

The following courses in Mechanical Engineering are offered. In connection with these the student may take courses in mathematics, pure and applied mechanics, chemistry, physics, and drawing, thus making up a purely professional course, and may also elect work from such of the general courses as time and preparation may admit.

1. Shop Work. *a.* Woodworking and Pattern Making. *Two exercises a week, through the year.* Mr. Buchanan. *b.* Foundry Work. *Three exercises a week, half year.* *c.* Forge Work. *Three exercises a week, half year.* Mr. Herby. *d.* Machine-shop Work. *Three exercises a week, through the year.*

[Course 1 *d* will not be given in 1893–94.]

Open to all students, and required of students in Mechanical and Electrical Engineering.

2. Elementary Machine Design. a. *Motion in Machines.* Analysis of relative motions in machines and study of the methods for their production. *Three hours a week* lectures and recitations, and *six hours a week* in the drafting room, *first semester.* Professor A. W. Smith.

Open to students who have completed solid geometry, and required of students in Mechanical and Electrical Engineering.

b. *Constructive Materials.* Study of the manufacture and physical qualities of materials. Intended to prepare the student for selection of materials for machine parts subjected to different working conditions. *Three hours a week* lectures and recitations, *six hours a week* in the drafting room, *second semester.* Professor A. W. Smith.

Open to students who have had elementary chemistry, and required of students in Mechanical and Electrical Engineering.

c. *Machine Elements.* Study of fastenings, bearings, sliding surfaces, etc., of cross sectional and outline forms and of machine support. *Two hours a week* recitations and lectures, and *nine hours a week* in the drafting room, *first semester.* Professor A. W. SMITH.

Open to students who have completed course 2, *a* and *b*, and required of students in Mechanical and Electrical Engineering.

d. *Force and Work in Machines.* Study of proportioning of stress members of machines. *Two hours a week* lectures and recitations, and *nine hours a week* in the drafting room, *second semester.* Professor A. W. SMITH.

Open to students who have completed course 2, *a*, *b* and *c*, and required of students in Mechanical and Electrical Engineering.

3. a. Steam Engineering. An elementary study of design and principles of the steam engine. Lectures and recitations. *Two hours a week, through the year.* Assistant Professor BRYANT.

Open to students who have completed the subject of heat in the department of physics, and required of students in Mechanical and Electrical Engineering.

b. Thermodynamics. Treatment of the mechanical theory of heat and its applications. Lectures and recitations. *Three hours a week, through the year.* Assistant Professor BRYANT.

Open to students who have taken course 3 *a*, and required of students in mechanical and electrical engineering.

4. Mechanical Laboratory. Testing of boilers, engines, and experimental investigation of correlated problems. *Two hours a week, through the year.* Assistant Professor BRYANT.

Open to students who have completed course 3 *a*. Required of students in Mechanical and Electrical Engineering.

No fifth year courses will be given in 1893–94.

Special Students in Mechanical and Electrical Engineering should have completed at least algebra through quadratic equations, and plane geometry.

ELECTRICAL ENGINEERING.

Professor F. A. C. PERRINE.

A department of Electrical Engineering has been established, and in addition to the work in electrical physics,

courses will be offered on the more strictly engineering side of electricity. The following will indicate the scope of the work: 1. Electromagnets and Dynamos. 2. Electrolysis and Electro-metallurgy. 3. Electrical instruments and measurements. 4. Electric circuits, and testing lines used in Telephony, Telegraphy, and Railway Signaling. 5. Alternating current machinery. 6. Electric light and transmission of power. 7. Electricity in engineering operations: (*a*) Electric railways; (*b*) Electricity in mining and quarrying; (*c*) Station management and estimates.

Details will be announced later.

MILITARY SCIENCE AND TACTICS.

Professor OYSTER.

Under provisions of the Revised Statutes of the United States an officer of the Army is detailed by the President as Professor of Military Science and Tactics.

The course of instruction will be both practical and theoretical. Upon occasions of military ceremony and when any other practical military instruction is being given, the student will appear in the uniform prescribed by the institution.

1. Practical Instruction in the U. S. Infantry and Artillery Drill. Regulations, small-arm target practice, and the duty of sentinels. *Three times a week, through the year.* Professor OYSTER.

2. Theoretical Instruction in Drill Regulations of the U. S. Army, the preparation of reports and returns pertaining to a company, the organization and administration of the U. S. Army, and the elementary principles governing in the art of war. *One hour a week, through the year.* Professor OYSTER.

STENOGRAPHY.

Assistant G. A. Clark.

The course in Shorthand is designed to provide students with a brief and rapid system of writing which will be of use to them in note-taking. It will be of especial interest to those electing their major subject in lines involving much lecture work or original research. Students should elect it so far as practicable in their first year. The course extends through two semesters, the work of the first being devoted to a study of the theory with exercises in reading and writing ; of the second, to an application of the theory in reading literature written in shorthand and in writing from dictation. A series of talks by the instructor on topics of value to the student will be made the basis of a practical application of the course. As collateral work students will be assigned subjects for investigation, and required to furnish abstracts of popular lectures. A uniform note-book and method of keeping it will be made an essential part of the work.

1. Theory and Practice. *a.* Theory: lectures and recitations. *Two hours a week, through the year. b.* Dictation and practice, requiring no preparation. *One hour a week. b* must be taken in connection with *a*, the three hours to count two hours' credit. Mr. G. A. Clark.

2. Theory and Practice. A repetition of course 1 for those wishing to begin the work with the second semester.

UNIVERSITY EXTENSION.

The details of the organization of University Extension societies are not undertaken by the University, but its professors are, in general, prepared to respond to any demand for courses of lectures not conflicting with University duties. They are also willing, whenever occasion

arises, to undertake work in Teachers' Institutes, and to take part in lecture courses in neighboring towns.

In addition to a large number of single lectures delivered in the various cities and towns of the State, the following more extended courses of work were presented during the year 1892-93:

1. Laws of Organic Life. A series of six lectures given in Alameda, by President JORDAN.

2. Application of the Laws of Evolution to Society. Seven lectures given in San Jose, by President JORDAN.

3. Laws of Organic Life. Four lectures given in Oakland, by President JORDAN.

4. Geology. A series of six lectures given in San Jose, by Professor BRANNER.

5. Representative Poets of the Nineteenth Century. A series of six lectures given in San Jose, by Professor ANDERSON.

6. Natural Selection in Modern Industry. A series of six lectures given in San Jose, by Professor WARNER. The same series to be repeated in Oakland.

7. Studies on Children. Four lessons given before the teachers of Alameda, by Professor BARNES.

8. Studies on Children's Drawings and Defective Spellers. Four conferences with a body of Teachers in San Francisco. Professor BARNES.

UNIVERSITY LECTURE COURSE.

Public lectures on subjects of general interest, by members of the Faculty or by persons invited from abroad, are given in the Chapel, usually on Tuesday evenings. The following is a list of the lecturers and subjects for 1892–93:

Professor WM. H. HUDSON—"Herbert Spencer."

President DAVID S. JORDAN—"The Value of Higher Education."

Professor FERNANDO SANFORD—"The Value of Scientific Knowledge."

Professor JULIUS GOEBEL—"The Study of Goethe."

Professors ANDERSON, HUDSON, and NEWCOMER—"An Evening with Tennyson."

Major J. W. Powell, of Washington, D. C.—"The Grand Cañon of the Colorado."

Mr. Edmund Russell, of Boston, Mass.—"The Life and Work of Delsarte."

Mr. Joaquin Miller, of Oakland—"How to Fight."

President David S. Jordan—"The Passion Play at Oberammergau."

Professor John C. Branner—"The Contemplation of Crime."

Dr. O. L. Elliott—"Ethics of the Tariff Controversy."

Professor Edward E. Barnard, of the Lick Observatory—"Recent Astronomical Discoveries."

Professor George E. Howard—"The Municipal Problem in the United States."

Professor Wm. H. Hudson—"The Miracle Play."

Professor Emory E. Smith—"The Island of Guernsey."

Professor Charles M. Gayley, of the University of California—"Irish Politics and Irish Political Leaders."

President David S. Jordan—"Rafinesque."

Professor Ewald Flügel—"Carlyle."

Miss Nettie E. Wickham, of New York City—"Readings from Browning."

Dr. J. H. Stallard, of Menlo Park—"Quackery."

Professor Earl Barnes—"A Successful Failure."

Mrs. Anna B. Comstock—"Wood Engraving."

Professor Amos G. Warner—"An English Philanthropist."

Professor Frederick C. Clark—"Woman and the State."

THE UNIVERSITY CHAPEL.

The following are the speakers and subjects for 1892–93, in the University Chapel, Sunday mornings at eleven o'clock, in accordance with the provision noted on page 26:

President Martin Kellogg, of the University of California—"The Simplicity of a True Religion."

The Rev. W. D. Williams, D. D., of San Francisco—"Signs and their Significance."

Professor Melville B. Anderson—"The Religious Views of Emerson."

The Rev. N. A. Haskell, of San Jose—"The Spirit of Truth will lead you into all Truth."

Professor MARY SHELDON BARNES—"The Bishops of the Fourth Century."

The Rev. H. H. BROWN, of Salem, Ore.,—"The Indwelling God."

The Rev. MATTHEW J. FERGUSSON, of San Francisco—"Christianity as Personal Truth."

The Rev. GEORGE R. DODSON, of Alameda—"The Religious Significance of Scientific Thought."

The Rev. ROBERT NOURSE, of Washington, D. C.—"Care for the Living."

The Rev. H. D. LATHROP, of Oakland—"Opening the Eyes."

The Rev. R. C. FOUTE, of San Francisco—"The Alpha and Omega."

The Rev. GEORGE E. WALK, of Oakland—"Imitators of Christ."

The Rev. W. W. THOBURN, of Mayfield—"Be ye Doers of the Word."

The Rev. T. D. ROBERTS, of Boston, Mass.—"Rescue Mission Work."

The Rev. WM. W. DAVIS, of San Francisco—"What is Faith ?"

The Rev. THOMAS H. VAN NESS, of San Francisco—"The Modern Trend toward the Kingdom of God."

The Rev. W. B. COPELAND, of Stockton—"The Burning Bush."

The Rev. J. K. MCLEAN, of Oakland—"The Higher Athletics."

The Rev. A. H. BRIGGS, of San Francisco—"The Cross of Christ."

The Rev. R. J. BRIGGS, D. D., of San Francisco—"The Greatness and Destiny of Humanity."

The Rev. JOHN Q. ADAMS, of San Francisco—"Making the most of Life."

Mrs. SARAH B. COOPER, of San Francisco—"Character Building."

Professor MARTIN W. SAMPSON—"Conventionality."

The Rev. GEO. C. GIFFEN, of Fowler—"Laborers with God."

Professor A. G. NEWCOMER—"Amiel and Modern Unrest."

The Rev. GEORGE H. GREER, of Mayfield—"The Seen and the Unseen."

The Rev. ALFRED LEE BREWER, of San Mateo—(Easter Service).

The Rev. A. C. HERRICK, of Sacramento—"The Labors of Others."

The Rev. WILLIAM F. NICHOLS, of San Francisco—(Baccalaureate Sermon).

THE HOPKINS SEASIDE LABORATORY.

Professors GILBERT and JENKINS, Directors.

The Hopkins Seaside Laboratory has been established as a branch of the biological work of the University, and holds its sessions during the summer months. The building is located at Pacific Grove, two miles west of Monterey, and stands on a low bluff immediately facing the sea. It is a two-story structure capable of accommodating about sixty students, and contains three general laboratories and six private rooms for special investigators. It is provided with aquaria and running water, and all necessary facilities for biological study. The library and apparatus of the University are available for use in the Seaside Laboratory.

The Laboratory makes provision for three classes of students:

1. Students in the Zoological, Physiological, and Botanical Departments of the University who wish to supplement their studies with work on living marine organisms under the favorable conditions of such a station.

2. Investigators who are prepared to make researches in marine biology, for which the Pacific Coast with its almost unworked field offers exceptional attractions.

3. Teachers or others who desire to become acquainted with marine animals and plants, and to learn the practical methods of their study.

SESSION OF 1892.

The first session of the Laboratory was held during the summer of 1892, beginning June 27th. The instruction was under the supervision of Professors Gilbert and Jenkins, assisted by Messrs. Greene, McFarland, and Davis. The following were in attendance:

Oramanda Boring, special student in Zoology, University.
Frank Cramer, graduate student in Zoology, University.
Bradley M. Davis, Assistant in Botany, University.
Cora M. Glidden, student in Zoology, University.
Charles W. Greene, Assistant in Physiology, University.
Flora Hartley, student in Zoology, University.
Leverett M. Loomis, Tyron City, N. C.
Ellen L. Lowell, Instructor in Physical Training, University.
Edward A. Markey, student in Zoology, University.
Mary E. Martin, student in Botany, University.
Frank M. McFarland, Instructor in Histology, University.
Adelaide L. Pollock, Teacher in Public Schools, Seattle, Washington.
Annette Richards, Science Teacher, High School, Grand Rapids, Mich.
W. W. Thoburn, graduate student in Zoology, University.
John VanDenburgh, student in Zoology, University.
Lucy M. Washburn, Professor of Physiology, State Normal School, San Jose.
Nancy M. Woodward, graduate student in Education, University.

SESSION OF 1893.

The session for 1893 will begin Monday June 5th, the regular course of instruction continuing until July 15th. Investigators or advanced students may arrange to continue their work for a longer period.

Fees.—To investigators, the facilities of the Laboratory are offered free. Students in the University who have taken the elementary courses in Zoology, Physiology, or Botany, will pay a fee of ten dollars to cover necessary expenses. All others will be charged a fee of twenty-five dollars.

Catalogue of Students.

GRADUATES.

Ashley, George Hall, *Rochester, N. Y.*, Geology
M. E., Cornell Univ.; A. M., L. S. Jr. Univ.

Beacham, Augustine, *Seattle, Wash.*, Education
B S., Kansas State Agricultural Coll.

Benzon, Oscar Magnus, *Newell, Iowa*, German
A. B., Augustana College.

Bland, Henry Meade, *College Park*, English
Ph. B. and Ph. D., Univ. of the Pacific.

†Bolton, Sarah, *Berkeley*, Drawing
Ph. B., University of California.

Bradshaw, Francis Elmer, *Millbrae*, Latin
A. M., Vanderbilt University.

†Bridgman, Judd Noble, *Manhattan, Kan.*, Mechanical Eng.
B. S., Kansas State Agricultural Coll.

Briggs, Stewart Daniel, *College Park*, Physiology
A. B., L. S. Jr. Univ.

Brown, Albert James, *New London, Ind.*, History
A. B., L. S. Jr. Univ.

Burrows, Fred Grant, *Chualar*, Physiology
A. B., L. S. Jr. Univ.

†Brown, Anna Louisa, *Burdett, N. Y.*, Drawing
B. P., Syracuse University.

†Butler, Charles Edgar, *Palo Alto*, Economics
A. B., Harvard University.

Chadsey, Charles Ernest, *Nebraska City, Nebr.*, History
A. B., L. S. Jr. Univ.

†Clark, Ella Cleveland, *Northampton, Mass.*, German
A. B., Smith College.

Clark, George Archibald, *Eden Prairie, Minn.*, Latin
B. L., University of Minnesota.

Clemans, Carl Lane, *Manchester, Ia.*, Physics
Ph. B., Cornell College.

Colin, Thérese F., *New York City*, Romance Languages
College of Neuchatel

†Cooke, Allyn Heald, *Salem, Oregon*, Chemistry
A. B., Willamette University.

Cooley, Frederic Allen, *Seymour, Ind.*, Mathematics
A. B., L. S. Jr. Univ.

Cox, Charles Ellwood, *College Park*, Mathematics
A. B., Haverford College.

†Cox, Exum Morris, *College Park*, Education
A. B., Haverford College.

Cox, Lydia Shipley Bean, *San Jose*, English
A. B., Penn College.

Cramer, Frank, *Appleton, Wis.*, Zoology
B. L., Lawrence University.

†Crothers, William Henry, *San Jose*, Physiology
A. B., L. S. Jr. Univ.

†Davis, Blanche, *Carson, Nev.*, French
A. B., University of Nevada.

†Dickinson, Eveline Laura, *Oakland*, German
A. B., Smith Coll.; A. M., L. S. Jr. Univ.

Foster, Frank Horton, *Woodruff, Ind.*, Mathematics
A. B., University of Indiana.

Greene, Charles Wilson, *Ireland, Ind.*, Physiology
A. B., L. S. Jr. Univ.

Hancock, John Allen, *Green Bay, Wis.*, Education
B. S., Baker Univ.; M. L., Univ. of Wisconsin.

Hannah, William Jones, *Davison, Mich.*, Social Science
A. B., University of Indiana.

Hardy, Irene, *Oakland*, English
A. B., Antioch College.

†Hoag, Ernest Bryant, *Evanston, Ill.*, Zoology
B. S., Northwestern University.

Hopkins, Thomas Cramer, *Greencastle, Ind.*, Geology
M. S., De Pauw Univ.; A. M., L. S. Jr. Univ.

Howard, Alice Frost, *Palo Alto*, History
Ph. B., University of Nebraska.

Howard, Joseph Henry, *Indianapolis, Ind.*, Latin
A. M., University of Indiana.

Hughes, James Boaz, *Redwood City*, Social Science
A. B., University of Indiana.

Jenness, Charles Kelley, *West Epping, N. H.*, Social Science
A. B., L. S. Jr. Univ.

Jordan, Jessie Knight, *Palo Alto*, English
A. B., University of Indiana.

Kellogg, Vernon Lyman, *Emporia, Kan.*, Entomology
B. S. and M. S., University of Kansas.

†Kendall, Flora Caroline, *Oakland*, German
A. M., University of Indiana.

Kirtland, John Copeland, Jr., *Tacoma, Wash.*, Latin
A. B., Hobart College.

Lewis, Ernest Dorman, *Evansville, Ind.*, History
A. B., L. S. Jr. Univ.

Mabury, Stella Blanche, *San Jose*, English
A. B., Vassar College.

McFarland, Frank Mace, *Olivet, Mich.*, Physiology
Ph. B., De Pauw University.

Mark, Cecil Wirt, *Santa Clara*, English
B. S., University of the Pacific.

Matthews, Emerson Waldo, *Denver, Col.*, Latin
A. B., Butler University.

Means, John Harrison, *Moorefield, Ind.*, Geology
A. B., Indiana Univ.; A. M., L. S. Jr. Univ.

Murphy, Daniel William, *Butler, Ind.*, Physics
A. B., L. S. Jr. Univ.

Newsom, John Flesher, *Elizabethtown, Ind.*, Geology
A. B., Indiana Univ.; A. M., L. S. Jr. Univ.

Russell, Jessie Eleanor, *San Jose*, History
Ph. B., University of the Pacific.

†Secrest, Emma, *Randolph, Kan.*, English
B. S., Kansas State Agricultural Coll.

Shaw, Walter Robert, *Moline, Ill.*, Botany
A. B., L. S. Jr. Univ.

Siebenthal, Claude Ellsworth, *Bloomington, Ind.*, Geology
A. B., L. S. Jr. Univ.

Smith, Kathryne Janette, *San Jose*, English
Ph. B., University of the Pacific.

Smith, Leigh Richmond, *San Jose*, Latin
A. M., Princeton College.

Smith Mary E. B. Roberts, *Palo Alto*, History
Ph. B, and M. S., Cornell University.

Squire, John Adams, *Arlington, Mass.*, Latin
A. B., Harvard University.

Stearns, Herman De Clercq, *Joliet, Ill.*, Physics
A. B.. L. S. Jr. Univ.

†Stowell, John Matson, *Morrison, Ill.*, Zoology
A. B., Knox College.

Stuchell, William Torrence, *Washington, D. C.*, Economics
A. B., New Windsor Coll.; LL. B., National Univ.

Thoburn, Wilbur Wilson, *Mayfield*, Zoology
A. B. and Ph. D., Allegheny College.

Thompson, Alva Beech, *San Jose*, English
B. S., Univ. of Michigan; A. M., L. S. Jr. Univ.

Vance, Jessica S., *San Jose*, English
Ph. B., University of the Pacific.

Washburn, Arthur Henry, *San Jose*, Mathematics
B. S., Worcester Polytechnic Institute.

Washburn, Jessica Thompson, *San Jose*, English
A. B., L. S. Jr. Univ.

†Way, Charlotte M., *Tempe, Arizona*, Chemistry
B. S., Swarthmore College.

†Pursuing wholly or mainly undergraduate courses.

UNDERGRADUATES.

†Aberdein, Carrie Blanche,	*Riverside*,	History
Adams, Edward Thomas,	*San Francisco*,	Mechanical Eng.
Adams, Maxwell,	*St. George, W. Va.*,	Chemistry
Alexander, John Edmundson,	*San Jose*,	Economics
Allabach, Lucy,	*Des Moines, Iowa*,	English
Ames, Elsa Lovina,	*Palo Alto*,	Drawing
Amesbury, Louise,	*Rockport, Me.*,	French
Anderson, Day Luther,	*Evansville, Ind.*,	Economics
Anfenger, Milton Louis,	*Denver, Col.*,	English
†Applegarth, May Sarah,	*Fresno*,	French
Archer, Leo Bethel,	*San Jose*,	Economics
Averett, Andrew Edgar,	*San Jose*,	Economics
†Babcock, Graham E.,	*Coronado*,	Romance Languages
Baker, Shirley,	*East Oakland*,	Electrical Eng.
†Baldwin, George Porter,	*San Francisco*,	Mathematics
Ballard, Roy Page,	*Seattle, Wash.*,	Mathematics
Bancroft, George Jarvis,	*Denver, Col.*,	Mechanical Eng.
Bannister, Lucius Ward,	*Des Moines, Iowa*,	English
Barker, Albert Charles,	*Menlo Park*,	Chemistry
Barnhisel, Arthur Henry,	*San Jose*,	English
Barr, Harry Newell,	*St. Paul, Minn.*,	Electrical Eng.
Barstow, Alfred, Jr.,	*Oakland*,	English
Batchelder, Francis Joseph,	*Glen Ridge, N. J.*,	Civil Eng.
Bean, Carrie Adeline,	*San Jose*,	Latin
†Bean, Harry Joel,	*San Jose*,	Electrical Eng.
Belden, Roy Keney,	*Oakland*,	Romance Languages
Belford, Samuel Widey,	*Denver, Col.*,	English
†Bernhard, Joseph Phillip,	*Fresno*,	English
Bishop, George Wells,	*San Jose*,	Physiology
Bishop, Hal Fiske,	*Alhambra*,	English
Blake, William Ford,	*Santa Clara*,	Physiology
†Blanding, Herbert Bowen,	*Alameda*,	English
Bledsoe, Benjamin Franklin,	*San Bernardino*,	History
†Bliven, Ralph Wagener,	*San Francisco*,	English
Boardman, Elizabeth Louise,	*Reno, Nev.*,	Latin
Boring, Oramanda,	*Wynola*,	Zoology
Bowman, Frances Agnes,	*San Francisco*,	Greek
†Briggs, William Dinsmore,	*Sacramento*,	Chemistry
Brim, Lucy May,	*Leesville*,	Physiology
Bristol, Susie Brown,	*Gainesville, N. Y.*,	English

†Brooks, Franklin Vanderbilt,	*New York City,*	Economics
†Brown, David Ewald,	*Oakland,*	Civil Eng.
Brown, Florence Villiers,	*San Jose,*	English
Brown, George Henry,	*Riverside,*	English
Brown, Lyman Van Wickle,	*Riverside,*	English
Brown, Will Lear,	*Rincon,*	Civil Eng.
Brown, Walter Shirlaw,	*Stockton,*	English
Buchanan, Bertha,	*Santa Cruz,*	Education
Buchanan, Richard Twells,	*Logansport, Ind.,*	English
Buck, Harriet A.,	*Hillsdale,*	English
Buck, Rufus,	*Seattle, Wash.,*	Mining Eng.
Bullock, Bertram Nathaniel,	*Eureka,*	English
Burke, Mary,	*Santa Cruz,*	English
Burnell, Charles Sumner Smith,	*San Francisco,*	Economics
Burnett, Arthur Hardin,	*Tulare,*	Mechanical Eng.
Burwell, Leslie Moulthrop,	*Sacramento,*	Latin
Buxton, Norman Geer,	*Johnstown, O.,*	Zoology
Caldwell, Winifred,	*Pasadena,*	Mathematics
Calhoun, Grant,	*La Conner, Wash.,*	Physiology
Calhoun, Scott,	*La Conner, Wash.,*	English
Campbell, Horace,	*College Park,*	English
Campbell, Murray Adrian,	*Des Moines, Iowa,*	English
†Campbell, Robert Willis,	*San Francisco,*	Mathematics
Campbell, William Evan,	*College Park,*	English
Capron, John Clinton,	*Plymouth, Ind.,*	English
Carran, Thomas Jefferson, Jr.,	*Los Angeles,*	Greek
Cathcart, Arthur Martin,	*Knoxville, Iowa,*	Greek
†Chamberlin, Lemuella,	*College Park,*	English
Chamberlin, Willis Perronet,	*Oakland,*	History
Chambers, Lewis Levi,	*Riverside,*	Economics
Champion, Lewis Frederick,	*Oakland,*	Electrical Eng.
Champlin, George Beecher,	*Red Bluff,*	Geology
Chapman, Bertha Louise,	*Oakland,*	English
Chapman, Elizabeth Corinne,	*Oakland,*	English
Chase, Lewis Nathaniel,	*Riverside,*	English
Clark, Grace Eleanor,	*San Jose,*	Physiology
Clark, Oliver Vincent,	*East Onondaga, N. Y.,*	Ar'tecture
Clark, Wellyn Brayton,	*Castorland, N. Y.,*	Mathematics
Cleveland, John Baxter,	*Normal, Ill.,*	Latin
Cochran, Guy Hunt,	*Los Angeles,*	English
Code, Thomas K.,	*San Francisco,*	Mining Eng.
†Coffey, Louis John,	*Redwood City,*	Civil Eng.

Coleman, Edgar Park,	*Decatur, Ill.*,	Mechanical Eng.
Collins, Samuel Wilson,	*Graham, Mo.*,	Physics
†Colliver, John Adams,	*San Bernardino*,	Physiology
Comstock, Sarah Leslie,	*Kansas City, Mo.*,	English
Condit, Benson Clare,	*Grinnell, Iowa*,	Electrical Eng.
Conners, George Wilbert,	*Santa Rosa*,	Civil Eng.
Coombs, Mabel,	*Marysville*,	English
†Copeland, Harold Townsend,	*Stockton*,	Mechanical Eng.
†Corbert, Anita Lawrence,	*Palo Alto*,	English
†Cory, Harriet,	*San Jose*,	English
Cory, Henry Manning,	*Fresno*,	Chemistry
Cory, Mabel Hyde,	*Fresno*,	English
Cory, Susanna,	*San Jose*,	English
Cotton, Aylett Rains, Jr.,	*San Francisco*,	History
Cox, Harry James,	*Petaluma*,	Chemistry
Cox, Jessie Hypatia,	*Danville*,	Physiology
Crane, Edgar Willis,	*Riverside*,	Mechanical Eng.
Crawford, Madge Susan,	*Nevada City*,	Botany
Critchlow, Charles Dilworth,	*New Brighton, Penn.*,	Physiology
Crosset, James Haven,	*San Francisco*,	Civil Eng.
Crothers, George Edward,	*San Jose*,	History
†Crow, Evelyn Gladys,	*San Jose*,	English
Crowell, Robinson,	*San Francisco*,	Mechanical Eng.
Cuddeback, Allan Winter,	*Cuddebackville, N. Y.*,	Civil Eng.
†Cullinan, Joseph Patrick,	*Santa Cruz*,	English
Cuthbertson, Geo. Washington,	*Manchester*,	Mechanical Eng.
Dart, Elbert Ripley,	*San Jose*,	Civil Eng.
†Davey, Charles Wesley,	*Portland, Or.*,	History
Davis, Everett Leroy,	*San Jose*,	Mathematics
De Haven, Lucie Gates,	*Mountain View*,	Physiology
De Laguna, Bertha,	*Oakland*,	Latin
De Laguna, Laura Frederica,	*Oakland*,	French
De Long, George Bowen,	*Novato*,	Chemistry
Diggles, James Arthur,	*Ft. Jones*,	Civil Eng.
Dodson, Shelby Martin,	*Santa Clara*,	Economics
Dole, Marion Foster,	*Riverside*,	Physiology
Donald, Robert L'Amy,	*Dundee, Scotland*,	Civil Eng.
Doty, Frank Carlton,	*Hastings, Neb.*,	History
Doub, William Coligny,	*Ottawa, Kan.*,	History
Downing, Claude Standish,	*Pleasanton*,	Civil Eng.
Downing, Paul Milton,	*Pleasanton*,	Civil Eng.
Doyle, Edmund Miller,	*Menlo Park*,	Mechanical Eng.

Drake, Robert Morris,	*Portland, Or.,*	Civil Eng.
Dray, Frank R.,	*Sacramento,*	Chemistry
Drumheller, Thomas Jesse,	*Walla Walla, Wash.,*	Economics
Durrell, Carleton Edgar,	*Pasadena,*	Mechanical Eng.
Dwyer, John Jeffrey,	*Sacramento,*	Electrical Eng.
Easton, Daniel Elisha Foote,	*San Francisco,*	Physiology
Eaton, Charles Frederick, Jr.,	*Santa Barbara,*	Mechanical Eng.
Eaves, Harriet Rumsey,	*Eugene, Or.,*	Physiology
Eaves, Lucile,	*Eugene, Or.,*	English
Ebert, John Edward,	*Marysville,*	English
Edwards, Wilbur James,	*San Jose,*	Mathematics
Ellery, Nathaniel,	*Eureka,*	Civil Engineering
Ely, Le Roy D.,	*Pasadena,*	English
Entler, Frank Lamond,	*Chico,*	Electrical Eng.
Evans, Caroline Hornbrook,	*Evansville, Ind.,*	English
Evans, Katherine Florence,	*Evansville, Ind.,*	Philosophy
Ewell, Edwin Chapin,	*Sonoma,*	Social Science
Faris, Marion Elizabeth,	*San Francisco,*	German
Faris, Wallace Somerville,	*San Francisco,*	Economics
Farmer, Elmer Elsworth,	*Vacaville,*	Civil Engineering
†Faxon, Henry Darlington,	*Kansas City, Mo.,*	Chemistry
Field, Charles Kellogg,	*Alameda,*	English
Field, Joel Yancy,	*Dallas, Texas,*	Economics
Fife, Charles Andrew	*Pasadena,*	Chemistry
Fife, Joseph Paull,	*Pasadena,*	Economics
Fitzgerald, James Joseph,	*Stockton,*	Latin
†Fletcher, William Baldwin, Jr.,	*Indianapolis, Ind.,*	English
Fogg, Frederick Seydel,	*Tacoma, Wash.,*	German
Folsom, Myron Arlie,	*Alexandria, S. Dak.,*	German
Fong, Walter Ngon,	*San Francisco,*	Greek
Foster, Benjamin Oliver,	*Salt Lake City, Utah,*	Latin
†Foster, Margaret,	*Salt Lake City, Utah,*	Greek
†Fowler, Nellie,	*Phœnix, Ariz.,*	English
†Fowler, William Atwater,	*San Jacinto,*	English
Frankenfield, Budd Doble,	*Los Angeles,*	Mechanical Eng.
Frankenheimer, Julius B.,	*Stockton,*	Chemistry
Fraser, Alfred Parker,	*Stockton,*	English
Frink, Egbert,	*Seattle, Wash.,*	History
Fry, Donald Hume,	*Vancouver, B. C.,*	Mech'ical Eng.
Fyffe, Harriet J.,	*Normal, Ill,.*	English
Garretson, Sarah Jane,	*Pendleton, Ind.,*	Mathematics
Gates, John McPherson,	*Hillsboro, Or.,*	Latin

Gilmore, Georgia Louise,	*Selma,*	English
Gilmore, Lucien Howard,	*Capron, Ill.,*	Mechanical Eng.
Gilmore, Paul Allen,	*Auburn, Nebr.,*	Philosophy
Goodall, Harry,	*San Francisco,*	Economics
Goodbody, Louise Anne,	*Gainesville, N. Y.,*	English
Greene, Albert John,	*Santa Cruz,*	History
Gregg, Josephine,	*San Luis Obispo,*	English
Gregg, Paul Mills,	*San Luis Obispo,*	English
Gregory, John Munford, Jr.,	*Suisun,*	History
Grosh, Milton David,	*San Francisco,*	Mechanical Eng.
Gruwell, Robert Lyon,	*Lower Lake,*	History
Guilbert, Kate,	*San Jose,*	English
Gunn, James Alexander, Jr.,	*Kelseyville,*	English
Guppy, Christine Mary,	*San Jose,*	Latin
Guppy, Mabel F.,	*San Jose,*	Latin
Guth, William Westly,	*San Francisco,*	History
Hadley, Frederick Harlan,	*Tulare,*	Physiology
Hamilton, Ernest G.,	*Riverside,*	Civil Eng.
Hammel, Julius Cæsar,	*Elberfield, Ind.,*	Philosophy
Hammond, Henry Powers,	*San Francisco,*	Chemistry
Harelson, William Hasting,	*Tulare,*	Mathematics
Harris, Henry,	*Olympia, Wash.,*	Physiology
Harter, Ralph Laban,	*San Jose,*	Civil Eng.
Hartman, Frederick Adolph,	*San Francisco,*	English
Harwood, Henry,	*Louisville, Ky.,*	Psychology
Haven, Mattie Elizabeth,	*Oakland,*	English
Hawxhurst, Robert, Jr.,	*San Francisco,*	Civil Eng.
Hays, Alice Newman,	*San Diego,*	English
†Hays, Eric Bligh,	*San Luis Obispo,*	Civil Eng.
Hayward, Ernest Chesney,	*Victoria, B. C.,*	Mechanical Eng.
†Hazzard, George Hercules,	*San Diego,*	English
Hazzard, William Clarence,	*Claquato, Wash.,*	History
Heiner, Lawrence Andrew,	*Redwood City,*	Mechanical Eng.
†Henderson, Charles Belknap,	*Elko, Nev.,*	History
Herby, Nels Jensen,	*Mayfield,*	English
Herrick, Jackman,	*Washington, D. C.,*	German
Herrick, Jane Powers,	*Sacramento,*	Latin
Herrick, Kate,	*Sacramento,*	Latin
Hetherington, Clark Wilson,	*San Diego,*	Education
Hichborn, Franklin,	*Santa Clara,*	English
†Hicks, Herbert Stephen,	*Rockford, Ill.,*	English
Hidden, Maurice Jackson,	*Vancouver, Wash.,*	History

Hidden, William Foster,	*Vancouver, Wash.*,	Mathematics
Hill, Charles Caleb,	*Pasadena*,	German
Hill, Ernest Rice,	*Montalvo*,	Physiology
†Hill, Nelly May,	*Independence, Or.*,	English
Hinsdill, Lester Jesse,	*Clarksbury*,	History
Hogg, Cora E.,	*Saratoga*,	Latin
Hogg, Charles Henry,	*Saratoga*,	History
Hollister, John James,	*Santa Barbara*,	Mining Eng.
Holmes, Marion Estelle,	*San Jose*,	Mathematics
Holsclaw, Florence Mabel,	*Gilroy*,	Physiology
Holsclaw, Grace Evelyn,	*Gilroy*,	German
Hoover, Herbert C.,	*West Branch, Ia.*,	Geology
Hopkins, Owen Griffith,	*Sacramento*,	History
†Hoppe, Minna Theresa,	*San Francisco*,	Physiology
†Hosmer, Alexander Townsend,	*Tacoma, Wash.*,	Mathematics
Houghton, Charles Edwin,	*Phila., Pa.*,	Mechanical Eng.
Howard, Ella Lowe,	*Indianapolis, Ind.*,	English
Hughes, Charles Colfax,	*Redwood City*,	English
Hunt, Harry Edward,	*Santa Ana*,	English
†Hyde, James MacDonald,	*Santa Clara*,	Zoology
Hyde, Walter Spalding,	*San Francisco*,	Mechanical Eng.
†Jack, Edgar Ewing,	*Gila Bend, Ariz.*,	Horticulture
Johnson, Ernest Huston,	*Sacramento*,	Economics
Johnson, Nello De Vore,	*Oregon City, Or.*,	English
Jones, Albert Lincoln,	*San Jose*,	Mathematics
Jones, Edward Conde,	*Los Angeles*,	English
Jones, Maud Bessie,	*Sacramento*,	English
Kaetzel, Charles Paul,	*San Luis Obispo*,	English
Kalenborn, Armin Victor,	*Tacoma, Wash.*,	English
Karasek, Matthew,	*Tacoma, Wash.*,	Chemistry
Kautz, Austin,	*Vancouver, Wash.*,	Civil Eng.
Keating, John Albert,	*Muskegon, Mich.*,	Economics
Kennedy, Martin Herbert,	*Denver, Col.*,	History
Kenower, Sanford K.,	*Huntington, Ind.*,	Mech'ical Eng.
Kiefer, Hugo Albert,	*Los Angeles*,	Physiology
Kimball, Edwin Boyce,	*Haywards*,	Geology
King, Henry Lane,	*Atchinson, Kan.*,	Civil Eng.
Kinney, Mary Ettie,	*San Jose*,	English
Kirby, Sarah Louise,	*South Bend, Ind.*,	English
Kirkbride, Walter Harold,	*Redwood City*,	Civil Eng.
Knox, Newton Booth,	*Sacramento*,	Electrical Eng.
†Kohler, Anna,	*St. Helena*,	English

Kokubo, Sadanosuke,	*Magoya, Japan,*	Greek
†Labbé, Charles Hênri,	*Portland, Or.,*	History
†Lackey, Howard Julian,	*Gold Hill, Nev.,*	Physiology
Langford, James Terry,	*Lodi,*	Mechanical Eng.
Laughlin, Homer Jr.,	*East Liverpool, O.,*	Mech'n'l Eng.
†Lawshé, Jay Earl,	*Tacoma, Wash.,*	English
Leadbetter, Horace Martin,	*Stockton,*	Civil Eng.
Leithold, Christian Ferdinand,	*Postville, Iowa,*	Electrical Eng.
†Lesley, Everett Parker,	*Santa Ana,*	Mechanical Eng.
Lewis, Abe, Jr.,	*Gilroy,*	History
Lewis, Anna Lena,	*Warrensburg, Mo.,*	Latin
Libby, William Sumner,	*New Richmond, Wis.,*	Psychology
Liliencrantz, Edith Eleanor,	*San Francisco,*	Physiology
Little, Ida May,	*Dunkirk, N. Y.,*	English
Logan, Lily Phebe,	*Stockton,*	English
Longley, Edward Roy,	*Los Angeles,*	Physiology
Longley, John Artemas,	*Mountain View,*	History
Longley, Mary Emily,	*Mountain View,*	History
†Lord, Fredericka Caro,	*Virginia, Nev.,*	French
Luckey, George W. A.,	*Riverside,*	Education
Luman, William Eugene,	*Santa Rosa,*	English
Lyle, Annie Galloway,	*San Francisco,*	English
Lyman, Edmund Rensselaer,	*College Park,*	Chemistry
Lynip, B. Frank,	*Adams, N. Y.,*	Latin
†Lyon, Darwin Balcom,	*Red Bluff,*	Marine Eng.
Mabury, Eugenia Beatrice,	*San Jose,*	English
MacCallum, Hamm'd Johnson,	*Halifax, N. S.,*	Mathematics
McCaughan, Nellie Eugenia,	*Durango, Mex.,*	Romance Lang.
McClain, William Henry,	*Dayton, Ohio,*	Electrical Eng.
McCord, William Hamilton,	*Farmer City, Ill.,*	Mech'cal Eng.
McDaniels, John Henry,	*Tacoma, Wash.,*	German
McFarland, Robert Daremas,	*San Jose,*	History
†McGeorge, Verne Adrian,	*Eureka,*	Mathematics
McGrew, John Tarn,	*Honolulu, H. I.,*	English
McGuire, William Lewis,	*Hanford,*	Electrical Eng.
†McIntosh, Charles,	*Palo Alto,*	Physics
†McIntosh, James,	*Palo Alto,*	Physics
†McLaine, Louis Donald,	*San Francisco,*	Mathematics
†McLaine, William Laughlin,	*San Francisco,*	Mechanical Eng.
†McLaughlin, Hilda,	*Victoria, B. C.,*	English
†McPherson, Frederick Duncan,	*Santa Cruz,*	Economics
Mace, Lewis Sayre,	*San Jose,*	Greek

Mackintosh, Kenneth,	*Seattle, Wash.,*	English
Magee, Chester Lea,	*San Diego,*	Physiology
Magee, Ernest De Los,	*San Diego,*	History
Makeever, Merton Forrest,	*Marseilles, Ill ,*	Mechanical Eng.
Manahan, Roland Harry,	*Pasadena*	Electrical Eng.
Marble, John Emerson,	*Los Angeles,*	Economics
Marsh, Olin Whitefield	*Santa Cruz,*	English
Matthews, Frank Cameron,	*Salem, Or.,*	History
Maxwell, Lee Hendron,	*St. George, W. Va.,*	Latin
Maynard, Rea Edwards,	*Los Angeles,*	Mechanical Eng.
†Mead, Mabel,	*Santa Cruz,*	English
Meany, Herbert St. John,	*Prescott, Ariz.,*	Electrical Eng.
Melvin, Howell Dew,	*Davisville,*	English
Merrill, Samuel, Jr.,	*Indianapolis, Ind.,*	English
Merritt, Alberta Lois,	*Woodland,*	English
Messinger, Victor Emery,	*Phœnix, Ariz.,*	Greek
Metcalf, John Nuckolls,	*San Diego,*	English
Miller, Cyrus Robinson,	*Sacramento,*	Chemistry
Miller, George Amos,	*Reedley,*	Economics
Miller, George B.,	*Kokomo, Ind.,*	Mathematics
†Mitchell, Deane Prescott,	*Ashtabula, O.,*	Mining Eng.
Monroe, Will Seymour,	*Pasadena,*	Education
Moody, Dora Estey,	*Pasadena,*	German
Moore, James Zachary, Jr.,	*Spokane, Wash.,*	Latin
Morgan, Grace Cecelia,	*Ontario,*	Latin
†Morrison, Frank William,	*Saxton's River, Vt.,*	Latin
Morrow, Howard,	*San Francisco,*	Physiology
Morton, Oliver Perry,	*San Francisco,*	English
Mosher, Clelia Duel,	*Palo Alto,*	Zoology
Moulton, Seba,	*New Whatcom, Wash.,*	English
Moulton, William Brooks,	*New Whatcom, Wash.,*	History
†Mumeda, Hiroshi,	*Yamagnchi, Japan,*	Economics
†Murphy, Thomas John,	*Riverside,*	Physiology
Murray, Edward Norman,	*Tacoma, Wash.,*	Chemistry
Nash, Kate Louise,	*Pasadena,*	English
Neidig, William Jonathan,	*Los Angeles,*	English
†Nesbit, Percy Montcalm,	*Pomona,*	History
Newell, James Blair,	*Santa Clara,*	Greek
Newman, Charles James,	*St. Helena,*	History
Nichols, Harriet A.,	*San Francisco,*	Latin
Nicholson, Francis John,	*Victoria, B. C.,*	Physiology
Norton, Arthur Lauren,	*Lodi,*	English

Nowell, John A.,	*College Park,*	History
O'Brien, Maurice William, Jr.	*San Jose,*	Mechanical Eng.
O'Brien, Percy Howard,	*San Francisco,*	History
Offield, Lorenzo Adolphus,	*Santa Clara,*	Greek
Orcutt, William Warren,	*Santa Paula,*	Civil Eng.
Osborne, Mary Myrtle,	*Warrensburg, Mo ,*	English
Otaki, Keinosuke,	*Tokio, Japan,*	Zoology
†Owens, James A.,	*San Francisco,*	Civil Eng.
Packard, Mabel Blanch,	*San Diego,*	English
Painter, Edward Emlen,	*San Francisco,*	Civil Eng.
Parcell, Charles Henry,	*Tampa, Fla.,*	Civil Eng.
Paton, Clara,	*Otay,*	History
Patterson, James Fred,	*San Jose,*	Economics
Pauly, Carl,	*San Diego,*	History
Penniman, Bessie Morris,	*Oakland,*	Latin
Peters, Louise,	*Terre Haute, Ind.,*	English
Pieper, Oscar Henry,	*San Jose,*	Electrical Eng.
Pierce, Henry Fisher,	*Milton, Or.,*	Horticulture
†Pierce, Maud Phœbe,	*Fresno,*	English
†Pierson, Charles J.,	*Auburn, Neb.,*	Zoology
Pillsbury, Ernest Sargent,	*Auburn,*	Physiology
Pinkham, Charles B.,	*Sacramento,*	German
Pitcher, Marie Louise,	*Tacoma, Wash.,*	English
Platte, Frank Theodore,	*Marysville,*	Mechanical Eng.
Pollock, Alfred Herman,	*San Francisco,*	Economics
Pomeroy, Thomas Henry,	*Oswego, Or.,*	Mechanical Eng.
Porter, D'Arcy Alan,	*Salinas,*	Civil Eng.
Potter, Clarence Denver,	*Oakland,*	English
Potter, Winfred White,	*San Francisco,*	English
Powell, Arthur Edward,	*Stockton,*	Civil Eng.
Pressley Lawrence Adams,	*Santa Rosa,*	English
Purdue, Albert Homer,	*Yankeetown, Ind.,*	Geology
Raish, Ralph Rittenhouse,	*Marysville,*	English
Rankin, Robert Erwin,	*Bell Buckle, Tenn.,*	Economics
Ray, Charley,	*Galt,*	History
Rea, Edwin Milton,	*San Jose,*	Latin
Reeves, Minnie,	*Seattle, Wash.,*	German
Reeves, William Henry, Jr.,	*Seattle, Wash.,*	Electrical Eng.
Reichenbach, Edwin Lincoln,	*Tacoma, Wash.,*	Physiology
Reilay, Luella May,	*Oakland,*	Mathematics
Reynolds, Florence,	*Los Angeles,*	English
Reynolds, Harry B.,	*Oakland,*	Physiology

Reynolds, Jackson Eli,	*Oakland,*	English
Rhodes, Jeremiah Milton,	*Jasper, Mo.,*	Education
Rice, Archie Bermingham,	*Santa Barbara,*	English
Rich, Ellsworth Lincoln,	*Mayfield,*	Greek
Richards, Flora Valentine,	*College Park,*	Mathematics
†Rockhold, John Ellsworth,	*Riverside,*	Civil Eng.
†Roper, Norman Brownell,	*Santa Ana,*	Electrical Eng.
Rose, Walter Malins,	*Ontario,*	History
Rosendale, Chas. Edward Barry,	*Pacific Grove,*	History
Rossiter, Janette Hall,	*Sheridan, Mont.,*	German
Roussel, Louise Mathilde,	*Ocean View,*	English
Roussel, Victoria Elizabeth,	*Ocean View,*	English
†Roy, Roland Free,	*Virginia City, Nev.,*	Elect'l Eng.
Ruddell, Almus Goar,	*San Jose,*	English
†Ruddell, Frank Stallo,	*San Jose,*	English
Russell, Tracy George,	*San Francisco,*	Physiology
†Salisbury, Dallas Merland,	*Tacoma, Wash.,*	Mechanical Eng.
Sandwick, Richard Lanning,	*Dryden, N. Y.,*	Latin
Sawyer, Arthur Rodney.	*Bunker Hill, Ill.,*	Electrical Eng.
Schallenberger, Frances Reese,	*San Jose,*	Latin
Schmidt, Alfred Francis Wm.,	*Turner, Or.,*	Greek
Schopbach, Lenora,	*Pasadena,*	English
Schulte, Wm. Henry Gerard,	*San Francisco,*	History
†Scott, Leslie Preston,	*Honolulu, H. I.,*	English
Searles, Dennis,	*Mojave,*	Mechanical Eng.
Sheehan, John Francis, Jr.,	*San Francisco,*	English
†Sheldon, Henry Davidson,	*Santa Clara, Cal.,*	History
Shelley, Elsie Hjerleid,	*Berryessa,*	Physiology
Shepherd, Frank Irving,	*Kyles, Ohio,*	Chemistry
Simmons, Samuel Ewer,	*Sacramento,*	Chemistry
Slayton, Helen Elizabeth,	*Stowe, Vt.,*	Latin
Sloan, James Edward,	*Mayfield,*	Greek
Smith, Alfred Augustus,	*Astoria, Or.,*	History
Smith, Carl Schurz,	*Eugene, Or.,*	History
Smith, Charles Howard,	*San Francisco,*	Mechanical Eng.
Smith, Harlan Clinton,	*Portland, Or.,*	English
Smith, Lewis Howell,	*Fresno,*	English
Smith, Walter Olcott,	*Detroit, Mich.,*	History
Snyder, John O.,	*Waterloo, Ind.,*	Zoology
Soper, Harleigh Frederick,	*San Francisco,*	Physiology
Southwick, Edmund Carmel,	*Mayfield,*	Electrical Eng.
†Spalding, Alfred Baker,	*Atchison, Kan.,*	Physiology

Stadtmuller, Henrietta Louise,	*San Francisco,*	English
Stafford, Walter Alfred,	*Santa Ana,*	Electrical Eng.
Stark, Herbert Spencer,	*Cleveland, Ohio,*	Mining Eng.
†Steffens, Laura,	*Sacramento,*	English
Steffens, Lottie,	*Sacramento,*	English
Stinson, Maude Evangeline,	*San Jose,*	English
Stoddard, Charles Harvey,	*San Jacinto,*	Mechanical Eng.
†Storey, Thomas Andrew,	*Gold Hill, Nev.,*	History
Stratton, George Draper,	*Riverside,*	Civil Eng.
Stuart, William Elder,	*San Francisco,*	Geology
Swain, Frances Morgan,	*Palo Alto,*	Mathematics
Swickard, Andrew,	*San Jose,*	Civil Eng.
Sylvester, Osborne Whitney,	*Monte Vista,*	Civil Eng.
Taber, Walter Cox,	*Stockton,*	Chemistry
Talbot, Mary Alice,	*Tulare,*	German
Tarrant, Alfred Overton,	*Magnetawan, Ont.,*	English
Teggart, Frederick John,	*Belfast, Ireland,*	English
†Tennyson, Howard A.,	*San Jose,*	Mechanical Eng.
Thomas, Carl Clapp,	*Pasadena,*	Electrical Eng.
†Thompson, Herbert Cooper,	*Eugene, Or.,*	Latin
Thompson, Ida Gertrude,	*Santa Barbara,*	English
Thompson, John West,	*Redwood City,*	Mechanical Eng.
Thompson, Walter Oregon,	*Modesto,*	Chemistry
Tibbs, William Luther,	*Smithfield, Penn.,*	Economics
Tilden, Heber Cady,	*San Francisco,*	English
Timm, Henry R.,	*Dixon,*	German
Tinkham, Laura Amanda,	*Medina, N. Y.,*	Mathematics
†Tobie, Willard Nathan,	*Hastings, Neb.,*	English
†Toombs, George,	*Modesto,*	Electrical Eng.
†Tregea, William Leonard,	*Des Moines, Iowa,*	Civil Eng.
Tregloan, John Roger Beecher,	*Amador City,*	Civil Eng.
Trumbo, Arthur Cook,	*Columbus Grove, O.,*	Economics
Trumbo, Howard Thompson,	*San Francisco,*	Economics
Tucker, Hannah Adella,	*Ontario,*	Latin
Unruh, David Spencer,	*Arcadia,*	Civil Eng.
Van Denburgh, John,	*Los Gatos,*	Zoology
†Vanderveer, George Francis,	*Grinnell, Iowa,*	English
Vostrovsky, Clara,	*San Jose,*	Education
Walters, Louise,	*Los Angeles,*	Chemistry
Walton, Harry Albert,	*Yuba City,*	Physiology
Warren, Thomas Rawson,	*Los Angeles,*	Economics
†Watson, James Owen,	*Portland, Or.,*	Latin

Watson, Thomas Sidney,	*Spokane, Wash.,*	Electrical Eng.
†Webb, Winifred,	*Pasadena,*	English
Weber, Anna Matilda,	*Buffalo, N. Y.,*	Latin
Webster, William Leander,	*San Jose,*	History
Wheeler, Richmond,	*Albany, Or.,*	Latin
White, Arthur Hain,	*Live Oak,*	Physiology
White, Paul Helb,	*Sedalia, Mo.,*	Electrical Eng.
†Whitehouse, Louis Mein,	*Oakland,*	Civil Eng.
†Whiting, Lulu Natalia,	*Mountain View,*	Latin
Whittier, Clarke Butler,	*Riverside,*	History
Whittier, Ida Clelia,	*Pocatello, Idaho,*	English
Wight, John Kinlay,	*Toronto, Can.,*	History
Wigle, Britton Day,	*Mayfield*	History
Wigle, Elsie Alice,	*Mayfield,*	Botany
Wigle, Gilbert Griffin,	*Mayfield,*	History
Wilbur, Ray Lyman,	*Riverside,*	Physiology
Wilkinson, Frank,	*Acampo,*	Civil Eng.
Williams, Charles Henry,	*Baraboo, Wis.,*	Mechanical Eng.
Williams, Fred Steele,	*Salem, Or.,*	History
Williams, Thomas Henry,	*Denver, Col.,*	English
Willis, Helen,	*Portland Or.,*	Latin
Wilson, Allan Kay,	*San Francisco,*	Mining Eng.
Wilson, James Fyffe,	*Mt. Palatine, Ill.,*	History
Winship, Walter Edwin,	*San Diego,*	Mathematics
Wolf, Walter,	*Sandy, Utah,*	Mechanical Eng.
Wood, Alfred Eugene,	*Palo Alto,*	Mechanical Eng.
Wood, Jessie Palen,	*San Jose,*	English
Wood, Nelle,	*Atlantic, Ia.,*	History
Wood, Oscar Baylies,	*Cupertino,*	Mechanical Eng.
Woodburn, Nettie Endora,	*San Diego,*	English
Woodward, Henry Thomas,	*San Diego,*	Physiology
Woodworth, George Lyman,	*St. Louis, Mo.,*	Electrical Eng.
Woolrich, Arthur G.,	*San Francisco,*	Civil Eng.
Wootten, Frank Bivens,	*Linden,*	Greek
†Wright, Charles Frederick,	*Mayfield,*	English
Wright, Max Goethe,	*Grand Rapids, Mich.,*	Rom. Lang.
Wright, Samuel Vaughan,	*San Luis Obispo,*	English
Yoder, Minnie Brooks,	*Des Moines, Ia.,*	Chemistry
†Younger, Charles Bruce, Jr.,	*Santa Cruz,*	English
Zion, Edwin Ray,	*Berkeley,*	Economics
Zumwalt, Don John,	*College Park,*	Civil Eng.

†In Partial Standing.

SPECIAL STUDENTS.

Allen, Hattie Elizabeth,	*San Jose,*	English
Andrade, Frank,	*Honolulu, H. I.,*	Civil Eng.
Ashton, Sara Bertha,	*Rockford, Ill.,*	Chemistry
Ashton, Willard Herbert,	*Rockford, Ill.,*	Physiology
Babcock, Elizabeth Merrill,	*Palo Alto,*	Botany
Bacon, Will Thomas,	*Baraboo, Wis.,*	Architecture
Bailie, Samuel Girvin,	*Los Angeles,*	English
Barnes, Adda Margaret,	*Martville, N. Y.,*	Education
Beans, Frances Louise,	*San Jose,*	English
Beans, Mary Virginia,	*San Jose,*	English
Black, Retta J.,	*Palo Alto,*	Drawing
Booth, Genevieve,	*San Mateo,*	English
Boutelle, Harry Moss,	*Fort Custer, Mon.,*	Mech'n'l Eng.
Bowman, Edna Alnida,	*San Jose,*	English
Bradford, Herbert Sampson,	*San Francisco,*	English
Braly, Elizabeth Madison,	*Palo Alto,*	Drawing
Briggs, Evelyn,	*Sacramento,*	Chemistry
Bruce, Frank L.,	*Norfolk, Va.,*	English
Bunker, Charles Emmons,	*Newman,*	Mechanical Eng.
Butcher, Arthur Charles,	*Santa Clara,*	Horticulture
Campbell, George August,	*Oakland,*	Mechanical Eng.
Canfield, William Henry,	*Kingston, N. Y.,*	Greek
Carpenter, Edward Emery,	*San Luis Obispo,*	Civil Eng.
Chadsey, Effie May,	*Mayfield,*	Physical Training
Chadsey, Lillie Belle,	*Mayfield,*	History
Clayton, Edgar Oscar,	*Vacaville,*	Economics
Cleveland, George Clifton,	*Watsonville,*	History
Cole, Frank Lorenzo,	*Whatcom, Wash.,*	Mining Eng.
Collier, Page Blackwood,	*Lakeport,*	Mechanical Eng.
Collier, Sarah Bell,	*Lakeport,*	Mathematics
Condit, Clyde Ernest,	*Ironton, Ohio,*	Electrical Eng.
Conn, Isabella,	*Fresno,*	Romance Languages
Copeland, Clement Austin,	*San Diego,*	Mathematics
Coxhead, Edith Maie,	*Oakland,*	English
Cram, Charles Maurice,	*Mt. Vernon, Me.,*	English
Culver, Julia Louise,	*Oakland,*	English
Cushman, Florence,	*San Jose,*	English
Davis, Grace,	*Carson, Nev.,*	Botany
De Haven, Eliza Gates,	*Mountain View,*	History
De Laguna, Frederica,	*Oakland,*	English

Dickey, Emma J.,	*Palo Alto,*	Chemistry
Dickson, James McCurdy,	*Ferndale,*	Chemistry
Dodd, Elmer Perry,	*Caldwell, Id.,*	Mathematics
Donahoo, Emery Allen,	*San Francisco,*	Mechanical Eng.
Dowell, Margaret Jane,	*Ocean View,*	Stenography
Duque, Luis,	*San Francisco,*	Rom. Philology
Eastwood, Sadie,	*San Jose,*	English
Eckley, Carroll Orrin,	*Brandon, Mt.,*	Mechanical Eng.
Estes, Hattie Bell,	*Webster City, Iowa,*	Drawing
Fairchild, Phœbe,	*Saginaw, Mich.,*	English
Farnsworth, Mercy Charlotte,	*Sacramento,*	Education
Fernald, Charles Anselm,	*Santa Barbara,*	Physiology
Fickert, Charles Marron,	*Greenwich,*	Civil Eng.
Flint, Frederick Willson, Jr.,	*Los Angeles,*	Economics
Fowler, Richard C.,	*Phoenix, Ariz.,*	Mechanic'l Eng.
Freyschlag, Cora Emma,	*San Jose,*	Drawing
Gale, Edward Nuckols,	*Memphis, Mo.,*	German
Gardner, Albro Jr.,	*Seattle, Wash.,*	Civil Eng.
Gardner, George Montgomery,	*Carson, Nev.*	Physiology
Gearn, Laura Dickson,	*San Diego,*	French
Gould, Carl Porter,	*Pomona,*	Civil Eng.
Gray, Harry Paul,	*Milwaukee, Wis.,*	Mechan'l Eng.
Gray, Zelma Ann,	*Lenox, Ohio,*	English
Greene, Mary Jean,	*Santa Cruz,*	Education
Grove, Edward Davis,	*Oakland,*	Civil Eng.
Haile, Lucy Willis,	*Vacaville,*	English
Hancock, Nellie Slonaker,	*Green Bay, Wis.,*	Education
Hancock, William Luther,	*Green Bay, Wis.,*	Physics
Hardcastle, Alice Louisa B'trice,	*London, England,*	Psychology
Hargreaves, George,	*Bronxville, N. Y.*	Electrical Eng.
Harris, Sylvia Fowler,	*Virginia, Nev.,*	French
Harrison, Lewis Gooding,	*Los Angeles,*	Mathematics
Hatfield, Victor Lyle,	*Sacramento,*	History
Helm, Cora,	*Marysville, Mo.,*	History
Herrold, George Herbert,	*San Jose,*	Civil Eng.
Hilliker, Eston Peter,	*Garden Grove,*	Electrical Eng.
Hilliker, William Merritt,	*Garden Grove,*	Civil Eng.
Hinkle, Edgar Cunningham,	*San Diego,*	History
Hislop, Joanna,	*Worthington, Minn.,*	English
Hodge, Ruby Mildred,	*Eureka,*	Education
Hodges, Myrtis Delano,	*Palo Alto,*	Spanish
Holly, Theodora H.,	*Woodland,*	Drawing

Howe, Agnes E.,	*Fredericksburg, Ia.*,	Education
Hudson, Robert Logan,	*Garey*,	Drawing
Hughes, Edward,	*Brookville, Ind.*,	Physiology
Hulme, Edward George,	*Portland, Or.*,	English
Jack, Francis Joseph,	*Decatur, Ill.*,	Horticulture
Johnson, William Lee,	*Palo Alto*,	Mechanical Eng.
Kaufman, Adolph G.,	*Olympia, Wash.*,	Civil Eng.
Keating, Mary Elizabeth,	*Muskegon, Mich.*,	Drawing
Kirkpatrick, Christine May,	*San Jose*,	Education
Knowles, William Andrew, Jr.,	*Oakland*,	Architecture
Krauss, Fred G.,	*Calistoga*,	Horticulture
Ladd, Laura Louise,	*Vacaville*,	Botany
Langille, Herbert Bamford,	*Hood River, Or.*,	Mechanical Eng.
La Page, Gertrude,	*Oroville*,	English
Lawrence, Ernest Edward,	*Lompoc*,	Mechanical Eng.
Leib, Lida Campbell,	*San Jose*,	English
Little, John Chester,	*Dunkirk, N. Y.*,	Mechanical Eng.
Loomis, Leverett Mills,	*Chester, S. C.*,	Zoology
Loveland, Alice Judd,	*Menlo Park*,	Anglo Saxon
Luce, Grace Adelaide,	*San Diego*,	English
Lunt, Samuel Collins Chase,	*San Francisco*,	Physiology
Mabury, Paul Rodman,	*San Jose*,	Drawing
McAdory, Robert John,	*Washington, D. C.*,	Mech'al Eng.
McCollum, Jennie Frances,	*Gervais, Or.*,	History
McCray, Alfred Marion,	*Oceanside*,	Civil Eng.
McDonnell, Robert Emmit,	*Bozeman, Mont.*,	Civil Eng.
McKay, William Archibald,	*Salt Lake City, Utah*,	Elec. Eng.
McLellan, Mary Belle,	*Belmont*,	English
Makeever, Merton Forrest,	*Marseilles, Ill.*,	Mechanical Eng.
Markey, Edward A.,	*Warrensburg, Mo.*,	Zoology
Martin, Henrietta Harper,	*Jamaica, West Indies*,	Drawing
Martin, Mary Elizabeth,	*Ithaca, N. Y.*,	Botany
Matson, Florence Lilian,	*Waterloo, Ind.*,	Physiology
Maxwell, William Lindsay,	*Sonora*,	Mechanical Eng.
May, Cornelia Alice,	*San Jose*,	History
Mayhugh, Stella Mary,	*Kearn's Cañon, Ariz.*,	Drawing
Mayo, Rebecca,	*Fulton*,	Drawing
Metcalf, Catherine,	*Lockeford*,	English
Meyrick, Mary Lily,	*Santa Cruz*,	Education
Miller, Elizabeth,	*San Jose*,	English
Miller, Helen Guthrie,	*Reno, Nev.*,	Physiology
Miller, Letitia Frances,	*San Jose*,	English

Mitchel, Edgar Lillian,	*Fowler*,	Mathematics
Mitchell, Fanny Howe,	*Ashtabula, O.*,	English
Miyahara, Joie Hisataro,	*Hiroshima, Japan*,	Elec. Eng.
Moffett, George Frank,	*Portland, Or.*,	Electrical Eng.
Morden, Lucena Mandana,	*Portland, Or.*,	English
Morton, Harriet Mason,	*Palo Alto*,	History
Moulton, Seba,	*New Whatcom, Wash.*,	English
Murray, William Bayliss,	*Tacoma, Wash.*,	Civil Eng.
Nash, Frank Channing,	*Spokane, Wash.*,	Economics
Nelk, Carl Nicholas,	*Williams*,	Mechanical Eng.
Noble, Willis Craig,	*San Diego*,	Civil Eng.
Oakey, Frances Hirshberg,	*Richmond, Va.*,	Romance Lang.
Ordway, Ruby Adaline,	*Santa Cruz*,	English
Paine, Grace Gertrude,	*Redlands*,	German
Paine, Winifred Mabel,	*Redlands*,	Botany
Parkman, Wallace Ernest,	*San Jose*,	Physiology
Patterson, Clyde Llewellyn,	*Eugene, Or.*,	Mechanical Eng.
Perrault, Alfred Frank,	*Dayton, Minn.*,	Chemistry
Perry, Mary Elizabeth,	*East Oakland*,	English
Phelps, Mary Florence,	*San Carlos*,	English
Pillsbury, Arthur Clarence,	*Auburn*,	Mechanical Eng.
Poindexter, Henry Tyhrie,	*Dillon, Mont.*,	Mechanical Eng.
Power, Elizabeth Pauline,	*Auburn*,	French
Price, William Wightman,	*Oakland*,	Zoology
Quelle, Julius A.,	*L. I. City, N. Y.*,	Civil Eng.
Ray, May Caldwell,	*Chicago, Ill.*,	Education
Rice, Malcolm Graeme,	*Eureka Springs, Ark.*,	Civil Eng.
Richardson, Margaret Watson,	*Palo Alto*,	Chemistry
Rose, Stella,	*Pomona*,	Physical Training
Ross, Bert Charles,	*Long Valley*,	Mechanical Eng.
Ross, Frank Harrison, Jr.,	*San Jose*,	Mechanical Eng.
Ross, Sarepta Ione,	*Long Valley*,	Drawing
Sawyer, Houghton,	*San Francisco*,	Mechanical Eng.
Scofield, Norman Bishop,	*Washington, Iowa*,	Zoology
Seale, Alvin,	*Fairmount, Ind.*,	Zoology
Secrest, Lily Gertrude,	*Randolph, Kan.*,	Physical Train.
Sibley, Elmer Henry,	*Dinuba*,	Civil Eng.
Simkins, Henry Walter,	*Arroyo Grande*,	Mathematics
Skilling, William Thompson,	*Los Angeles*,	Chemistry
Smith, Clara Hettie,	*Nordhoff*,	Mathematics
Smith, Cyrus Lamson,	*Tacoma, Wash.*,	Economics
Smith, Mark Judson,	*Elmwood, Ill.*,	English

Smythe, Emma Louise,	*Santa Rosa,*	Educa tion
Snyder, Charles David,	*Fletcher, Wash.,*	English
Sorenson, Olaf Lauritz,	*Honolulu, H. I.,*	Civil Eng.
Spiger, Huber Clinton,	*Ravenna, Wash.,*	History
Stockton, Anna Augusta,	*Independence, Or.,*	Botany
Stoltenberg, Clara,	*Los Angeles,*	Education
Stoner, Susan Lavinia,	*Centre View, Mo.,*	English
Stump, Jessie Belle,	*Salem, Or.,*	French
Swain, Edward Lemmon,	*Dinuba,*	Civil Eng.
Sylvester, Franklin George,	*Monte Vista, Col.,*	Civil Eng,
Terrell, Glanville,	*Nipomo,*	Latin
Thomas, Benjamin,	*Palo Alto,*	Physiology
Thompson, James Reuben,	*Portland, Or.,*	Electrical Eng.
Timm, William Delbert,	*Dixon,*	German
Townsend, Bertrand William,	*San Francisco,*	Mathematics
Watson, Frank Milton,	*San Jose,*	Electrical Eng.
Way, Rachel Pugh,	*Tempe, Ariz.,*	Physical Training
Weber, Fred George,	*Buffalo, N. Y.,*	Civil Eng.
Welch, Harris Benjamin,	*Watertown, Dak.,*	Education
White, James Corbett,	*Honolulu, H. I.,*	Civil Eng.
White, John Wesley,	*Oakland,*	Civil Eng.
Williams, Emily Eolian,	*San Jose,*	English
Williams, Olive Augusta,	*San Francisco,*	French
Wilson, George Benton,	*Rialto,*	Economics
Wilson, John Henry,	*Honolulu, H. I.,*	Civil Eng.
Wood, Abbie Alden,	*Palo Alto,*	Physical Training
Wood, Henry Adams,	*Portland, Or.,*	Electrical Eng.
Woolsey, Walter Elliott,	*Oakland,*	Physiology
Wright, Annie Louise,	*Mayfield,*	Education
Yamakami, Ikutaro,	*Ishikawa, Japan,*	Physics
Young, Nellie Brown,	*Des Moines, Iowa,*	French
Zakany, Juan,	*San Francisco,*	Romance Lang.

SUMMARIES.

BY CLASSES.

GRADUATES:		
Pursuing Graduate Courses	51	
Pursuing Undergraduate Courses	15	
		66
UNDERGRADUATES:		
In Regular Standing	421	
In Partial Standing	79	
		500
SPECIAL STUDENTS		198
Total (men, 537; women, 227)		764

BY MAJOR SUBJECTS.

	Graduates	Undergraduates	Specials	Total	*No. of Students in all classes	*Total reg'str'n in all classes
Greek	—	14	1	15	32	34
Latin	7	32	1	40	60	97
German	4	13	3	20	257	294
Romance Lang.	2	8	11	21	255	287
English	11	130	37	178	446	739
Psychology	—	2	1	3	70	57
Philosophy	—	3	—	3	95	122
Education	3	6	12	21	41	57
History	6	51	11	68	271	321
Economics	4	28	5	37	86	115
Mathematics	4	22	8	34	265	448
Physics	3	3	2	8	94	94
Chemistry	2	21	7	30	79	153
Botany	1	2	6	9	18	18
Entomology	1	—	—	1	30	55
Horticulture	—	2	3	5	10	19
Physical Training	—	—	5	5	345	387
Physiology	5	36	10	51	81	90
Zoology	4	8	5	17	60	62
Geology	5	5	—	10	37	49
Drawing	2	1	12	15	108	111
Architecture	—	1	2	3	—	—
Mining Eng.	—	6	1	7	—	—
Civil Eng.	—	40	23	63	71	77
Mechanical Eng.	1	66	31	98	155	171
Military Science	—	—	—	—	29	29
Stenography	—	—	1	1	68	68

* First semester, except in Entomology and Military Science.

BY RESIDENCES.

	Residence	Place of Birth		Residence	Place of Birth
California	468	213	Arkansas	1	1
Washington	40	17	Florida	1	1
Indiana	31	50	Kentucky	1	7
Oregon	29	19	New Hampshire	1	1
New York	21	38	New Jersey	1	1
Illinois	18	61	South Carolina	1	—
Iowa	18	43	Tennessee	1	3
Missouri	12	24	Texas	1	2
Nevada	11	14	Connecticut	—	3
Ohio	10	41	Rhode Island	—	3
Arizona	8	—	Alabama	—	2
Wisconsin	8	21	Mississippi	—	1
Colorado	7	6	Wyoming	—	1
Kansas	7	22	Canada	7	15
Michigan	7	13	Hawaiian Islands	6	5
Nebraska	5	6	Japan	5	8
Minnesota	4	11	England	1	9
Montana	4	4	Ireland	1	3
Utah	4	4	Mexico	1	3
Dist. of Columbia	3	—	Scotland	1	1
Pennsylvania	3	23	West Indies	1	1
Vermont	3	8	Germany	—	4
Idaho	2	2	China	—	2
Maine	2	13	Australia	—	1
Massachusetts	2	16	Denmark	—	1
South Dakota	2	—	France	—	1
Virginia	2	3	New Zealand	—	1
West Virginia	2	2	Spain	—	1

CALIFORNIA BY COUNTIES.

Alameda	37	San Diego	22
Amador	1	San Francisco	53
Butte	2	San Joaquin	15
Colusa	2	San Luis Obispo	8
Contra Costa	1	San Mateo	13
Fresno	9	Santa Barbara	7
Humboldt	5	Santa Clara	138
Kern	2	Santa Cruz	12
Lake	3	Solano	8
Lassen	2	Sonoma	7
Los Angeles	35	Siskiyou	1
Marin	1	Stanislaus	3
Monterey	3	Sutter	1
Napa	3	Tehama	1
Nevada	1	Tulare	8
Orange	6	Tuolumne	1
Placer	3	Ventura	4
Sacramento	18	Yolo	4
San Bernardino	12	Yuba	5

First Annual Commencement.

JUNE 15, 1892.

COMMENCEMENT ADDRESS—"What makes a nation great."

By the Rev. MYRON W. REED, of Denver, Colo.

DEGREES CONFERRED.

BACHELORS OF ARTS.

In English Literature:

Charles Kelley Jenness, *West Epping, N. H.*
James Freeman Jenness, *West Epping, N. H.*
Jessica Thompson Washburn, *San Jose.*

In Education:

Watson Nicholson, *Pendleton, Ind.*

In History:

Albert James Brown, *New London, Ind.*
Charles Ernest Chadsey, *Nebraska City, Neb.*
Thomas Graham Crothers, *San Jose.*
Francis James Dennis, *Nevada City.*
Archer Kincaid, *Redwood.*
Ernest Dorman Lewis, *Evansville, Ind.*
Virgil Chesley Richards, *College Park.*
Elmer Boyce Williams, *San Jose.*

In Economics:

John Duvall Wallingford, *Greensburg, Ind.*

In Mathematics:

Frederic Allen Cooley, *Seymour, Ind.*

In Physics:

Daniel William Murphy, *Butler, Ind.*
Herman De Clercq Stearns, *Joliet, Ill.*

In Botany:
Bradley Moore Davis, *Chicago, Ill.*
Walter Robert Shaw, *Moline, Ill.*

In Entomology:
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In Physiology:
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Horace Elbert Williams, *Fayetteville, Ark.*

In Steam Engineering:
John Reboul Whittemore, *St. Louis, Mo.*

At large:
Stewart Daniel Briggs, *College Park.*
Fred Grant Burrows, *Chualar.*
William Henry Crothers, *San Jose.*
George Alfred Lawrence, *Los Gatos.*
Edith Wilcox, *San Jose.*

MASTERS OF ARTS.

In Latin:
Eveline Laura Dickinson, A. B., *Oakland.*

In Romance Languages:
Emmet Lee Richardson, A. B., *Evansville, Ind.*

In English Literature:
Alvah Beech Thompson, B. S., *San Jose.*

In Philosophy:
Frederic Lister Burk, B. L., *Mountain View.*

In Education:
Nancy Margaret Woodward, B. S., *Bloomington, Ind.*

In Geology:
George Hall Ashley, M. E., *Rochester, N. Y.*
John Harrison Means, A. B., *Moorefield, Ind.*
Thomas Cramer Hopkins, M. S., *Greencastle, Ind.*
John Flesher Newsom, A. B., *Elizabethtown, Ind.*

Alumni Association.

ORGANIZED JUNE 15, 1892.

President, - - - -	Charles Kelley Jenness, '92
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